

FOR TEACHERS ONLY

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

LIFE SCIENCE: BIOLOGY

Wednesday, August 20, 2025 — 12:30 to 3:30 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: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> 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 Life Science: Biology. Additional information about scoring is provided in the publication *Information Booklet for Scoring the Regents Examinations in Earth and Space Sciences and Life Science: Biology*.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the 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 space provided. The student's score for the Life Science: Biology test should be recorded in the space provided. Then the student's raw score on the test should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> no later than August 20, 2025. 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.

The test item map on page 11 identifies the Performance Expectation with which each test question is aligned. All NYSP-12SLS Performance Expectations are three-dimensional (<https://www.nysed.gov/sites/default/files/programs/standards-instruction/p-12-science-learning-standards.pdf>). The integration of these three dimensions provides students with a context for the content of science (DCI), the methods by which science knowledge is acquired and understood (SEP), and the ways in which the sciences are connected through concepts that have universal meaning across the disciplines (CCC).

- 1** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The vascular bundle delivers absorbed water from the root system to parts of the shoot system, such as the leaves, so they can perform photosynthesis.
 - Leaves use materials such as water, which is transported by the vascular bundle from the root system to the shoot system.
 - Roots absorb water/minerals, that are carried by the vascular bundle through the shoots to the rest of the plant.
 - The vascular bundle carries food from the shoots/leaves to the roots to be stored.
- 2** [1] Allow 1 credit for 3.
- 3** [1] Allow 1 credit for 1.
- 4** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- As trees age and their diameter increases from 40 to 60 cm, they store 2.5 times more carbon. The carbon is absorbed from the atmosphere and stored in the biosphere.
 - As trees age and grow larger in diameter, more carbon is stored in their structures. Plants absorb carbon dioxide from the air and combine it with water.
 - Older and larger trees are able to store more carbon, since they use the carbon from the atmosphere and store the carbon in plant structures in the biosphere.
- 5** [1] Allow 1 credit for 3.
- 6** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Young shrews nurse and are cared for by their mother for 22 to 25 days. Bluefin tuna receive no parental care.
 - Shrews feed on mothers' milk instead of feeding on each other, which provides parental care and increases the percentage of surviving offspring.
 - The caravan makes it possible for the shrews to be better protected as they move from place to place, increasing their chances for survival.
- 7** [1] Allow 1 credit for 2.

- 8 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Line *A* represents populations in which most members live to an older age. Line *C* represents populations whose members die young. About 50% of the shrews live to adulthood, so Line *B* best represents the shrews.
 - This is represented by Line *B* on the graph because about 50% of young shrews survive to adulthood because they form caravans.
 - Line *B* best represents shrew survival because about 50% of the young will survive to be adults.

- 9 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- As a result of this protective behavior, more bison calves survive and pass this adaptation on to their offspring.
 - When threatened, the male and female bison form a protective circle around the calves, increasing the chances that the calves will survive and pass on this behavior.
 - This is an adaptation that increases their chances of surviving, reproducing, and passing this adaptation on to future generations.

10 [1] Allow 1 credit for 4.

11 [1] Allow 1 credit for 1.

- 12 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- After eating the leaves, silkworms will rearrange the elements/subunits present in glucose and combine them with other elements to form amino acids that are combined to make proteins.
 - Silkworms use the glucose from the mulberry plant to make proteins by rearranging the carbon, hydrogen, and oxygen with the addition of nitrogen to form the subunits necessary to make proteins.

13 [1] Allow 1 credit for 2.

14 [1] Allow 1 credit for:

Partial DNA	GAT	CAA	TTA	AAT
mRNA	CUA	GUU	AAU	UUA
Amino acids	LEU	VAL	ASN	LEU

15 [1] Allow 1 credit for 2.

16 [1] Allow 1 credit for 2.

17 [1] Allow 1 credit for 3.

18 [1] Allow 1 credit for 1.

19 [1] Allow 1 credit for an acceptable evidence. Acceptable responses include, but are not limited to:

Beehive Fences:

- There would be less destruction of property and crops from elephants, and since bees are a natural part of the environment adding the hives would not negatively impact the environment.
- People, villages, and agriculture will be protected from damage, and “least” impactful because resource management hunting will remove elephants from the ecosystem and decrease biodiversity.

Resource Management Hunting:

- maintains elephant populations and controls problem elephants while ensuring that the areas of elephant habitat will be preserved
- regulates elephant hunting and may reduce poaching, whereas bee fencing could impact nearby villages.

20 [1] Allow 1 credit for 1.

21 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The process is decomposition. During decomposition, carbon dioxide is released from the biosphere to the atmosphere/hydrosphere.
- Decomposition returns/recycles carbon from dead organisms to the atmosphere/geosphere, enabling the carbon cycle to continue.

22 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- More krill will eat more phytoplankton, which will reduce photosynthesis levels, resulting in more atmospheric carbon.
- Increased numbers of krill in the biosphere will reduce phytoplankton, which absorb CO₂, so CO₂ in the atmosphere will increase.

23 [1] Allow 1 credit for 3.

24 [1] Allow 1 credit for 3.

25 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- All somatic cells within one human have the same genetic content/chromosomes, but they only express specific genes, such as **KRT1** or **KRT12** on different chromosomes, that enable them to perform different functions through the production of specific proteins, resulting in specialized cells.
- Different cells use different genes that are found on different chromosomes. For example, cells of the cornea use the **KRT12** gene and skin cells use the **KRT1** gene.
- All body cells have the same DNA. In order to carry out their specific function, cornea cells express specific genes on chromosome 17 and skin cells express genes of chromosome 12 resulting in specialized cells and produce specific proteins when they express different genes.

26 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The mutation in the normal **KRT10** gene is a deletion of two codons, which results in a deletion of two amino acids. Since the amino acid chain is shorter a different protein will be formed.
- The normal **KRT10** gene contains Glu and Pro in the fourth and fifth position, but they are omitted from the mutated gene. This causes a different protein to form.
- In the mutated **KRT10** gene there are fewer nucleotides resulting in fewer amino acids. This causes a different protein to form.

27 [1] Allow 1 credit for 2.

28 [1] Allow 1 credit for 2.

29 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The circulatory system is made up of blood vessels. The excretory system includes the kidney, which is made of nephrons. The blood vessels bring blood to the nephron, where it is filtered to form concentrated urine.
- Blood vessels of the circulatory system bring blood to the kidney, where the nephrons filter the blood, conserving water.
- As blood flows through blood vessels of the circulatory system to the kidneys of the excretory system, it enters capillaries within a nephron. The nephron filters out waste, and most water is returned to the body.
- Water and wastes diffuse out of the capillaries into the nephrons of the kidney. The blood is filtered in the nephron to produce urine that contains little water.

30 [1] Allow 1 credit for 2.

31 [1] Allow 1 credit for 4.

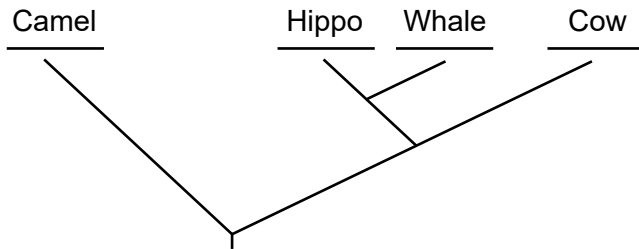
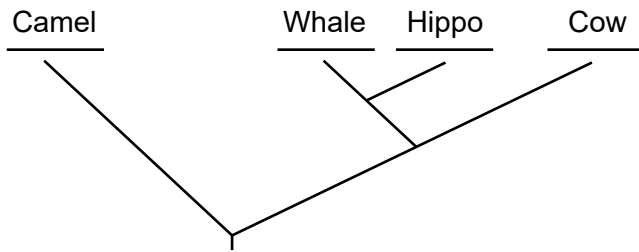
- 32** [1] Allow 1 credit. Acceptable responses include but are not limited to:
- With reduced water availability, there will not be as much vegetation and the kangaroo rat's food and water supply will drop drastically, which will decrease the carrying capacity of kangaroo rats.
 - If the trend in the drought conditions continues, there will be very little water for plants and the moisture in the food (plants) eaten by the kangaroo rat will decrease, which will lower their carrying capacity.
 - Without enough water, there will be less food and water for the kangaroo rat. The rat population will suffer a serious decline.

33 [1] Allow 1 credit for 3.

34 [1] Allow 1 credit for 4.

35 [1] Allow 1 credit. Acceptable responses are:

Examples of 1-credit responses:



36 [1] Allow 1 credit for 2.

37 [1] Allow 1 credit for 1.

38 [1] Allow 1 credit for 2.

39 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Cell A contributes half the genetic information in the new single cell. Since the new single cell divides by mitosis to produce the morula, the error would be passed on to all cells.
- Cell A gives the new cell half of its genetic information. Process Y is mitosis, so all of the cells are identical and will have the error.
- The DNA from Cell A is passed on to the new cell by mitosis, so each cell will have identical DNA.

40 [1] Allow 1 credit for 4.

41 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Using animal models before testing new procedures and medications on humans reduces the chances of humans being harmed, but pigs may not respond to medications in same way as humans.
- Most animals are inexpensive to maintain and plentiful, so using animal models would be more cost-effective, but animals are biologically different from humans. The medications may produce unexpected results that are different in each organism.
- Pigs have similar organs that function in similar ways to humans, but animals should not be used to test human medications because it is morally wrong and other, more humane alternatives for testing may exist.

Note: Answer must include *both* one benefit and one drawback to satisfy the trade-off component.

42 [1] Allow 1 credit for 3.

43 [1] Allow 1 credit for 3.

44 [1] Allow 1 credit for 1.

45 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The panthers and other wildlife may not initially use the bridges, but over time may learn to use them more often. This would reduce the number of panthers hit by cars and help maintain their biodiversity and connections to breeding grounds, while increasing the aesthetics for both wildlife and humans.
- The bridges look like a part of the ecosystem and would provide a passage for humans and other animals to use to safely cross the highway. However, there would be an additional cost required to build and maintain these bridges.
- The bridges join fragmented habitat by allowing the panthers to safely cross the highway without car collisions, increasing their chance of surviving and reproducing, which would maintain biodiversity. This would maintain ecosystem stability.

Note: Student responses must include *at least two* constraints.

The *Chart for Determining the Final Examination Score for the August 2025 Regents Examination in Life Science: Biology* will be posted on the Department's web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> no later than August 20, 2025. Conversion charts provided for previous administrations of the Regents Examination in Life Science: Biology 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 <https://www.nysed.gov/state-assessment/teacher-feedback-state-assessments>.
2. Click Regents Examinations.
3. Complete the required demographic fields.
4. Select the test title from the Regents Examination dropdown list.
5. Complete each evaluation question and provide comments in the space provided.
6. Click the SUBMIT button at the bottom of the page to submit the completed form.

THE STATE EDUCATION DEPARTMENT
THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234
 August 2025 Life Science: Biology Test Item Map to the Standards

Question	Type	Points	Performance Expectation
1	Constructed Response	1	HS-LS1-2
2	Multiple Choice	1	HS-LS1-3
3	Multiple Choice	1	HS-LS2-2
4	Constructed Response	1	HS-ESS2-6
5	Multiple Choice	1	HS-LS2-8
6	Constructed Response	1	HS-LS4-2
7	Multiple Choice	1	HS-LS2-2
8	Constructed Response	1	HS-LS4-3
9	Constructed Response	1	HS-LS4-2
10	Multiple Choice	1	HS-LS4-4
11	Multiple Choice	1	HS-LS1-7
12	Constructed Response	1	HS-LS1-6
13	Multiple Choice	1	HS-LS1-2
14	Constructed Response	1	HS-LS1-1
15	Multiple Choice	1	HS-LS2-2
16	Multiple Choice	1	HS-LS3-3
17	Multiple Choice	1	HS-LS4-4
18	Multiple Choice	1	HS-LS2-6
19	Constructed Response	1	HS-ETS1-3
20	Multiple Choice	1	HS-LS2-5
21	Constructed Response	1	HS-LS2-5
22	Constructed Response	1	HS-ESS2-6
23	Multiple Choice	1	HS-ESS2-6
24	Multiple Choice	1	HS-LS1-1
25	Constructed Response	1	HS-LS1-4
26	Constructed Response	1	HS-LS1-1
27	Multiple Choice	1	HS-LS3-2
28	Multiple Choice	1	HS-LS4-2
29	Constructed Response	1	HS-LS1-2
30	Multiple Choice	1	HS-LS4-4
31	Multiple Choice	1	HS-LS1-2
32	Constructed Response	1	HS-LS2-1
33	Multiple Choice	1	HS-LS4-1
34	Multiple Choice	1	HS-LS4-2
35	Constructed Response	1	HS-LS4-1
36	Multiple Choice	1	HS-LS4-1
37	Multiple Choice	1	HS-LS1-8
38	Multiple Choice	1	HS-LS1-4
39	Constructed Response	1	HS-LS1-8
40	Multiple Choice	1	HS-LS1-4
41	Constructed Response	1	HS-ETS1-3
42	Multiple Choice	1	HS-LS4-4
43	Multiple Choice	1	HS-LS2-4
44	Multiple Choice	1	HS-LS4-5
45	Constructed Response	1	HS-ETS1-3