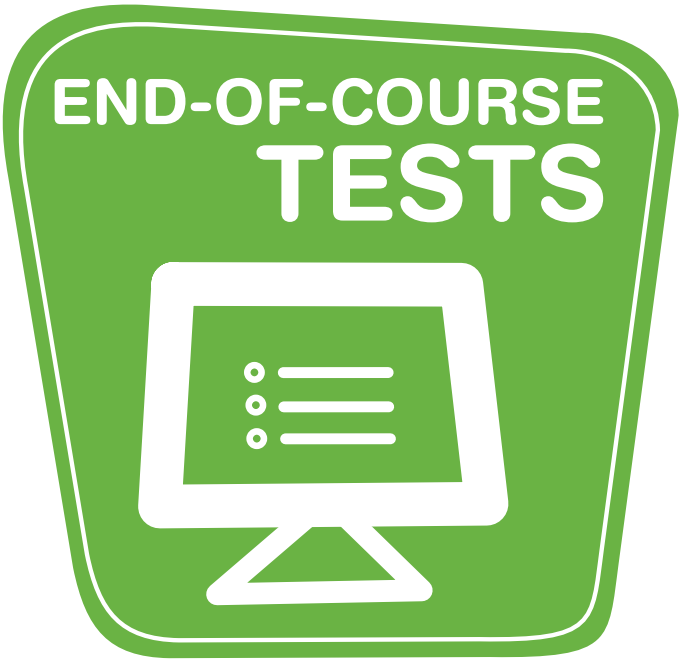
Biology End-of-Course (EOC)

Assessment Guide



Division of Assessments and Accountability

Louisiana Department of
EDUCATION

Paul G. Pastorek
State Superintendent of Education
January 2010

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Preface

What Is End-of-Course Testing?
End-of-course (EOC) testing, a recommendation of the Louisiana High School Redesign Commission, is an increasingly common practice nationwide. End-of-course tests help ensure consistent and rigorous instruction and expectations throughout the state.

Beginning with first-time 9th graders in the 2010–2011 school year, EOC tests will replace GEE for the graduation requirements. For further information, see **Bulletin 741**.

What Is the Purpose of the *Assessment Guide*?
The *Assessment Guide* provides an overview of the Biology EOC test, which will be field-tested online in May 2010. In addition to providing teachers with a description of the overall design of the test, this guide presents sample test items and suggested informational resources. Teachers should use this guide to

- become familiar with the Biology EOC test format,
- include similar item formats in classroom instruction and assessments,
- align instruction and assessment with the Louisiana Comprehensive Curriculum and Grade-Level Expectations (GLEs), and
- provide appropriate test accommodations.

What Does the *Assessment Guide* Include?
This guide includes information about

- test design (format and test blueprint),
- test content (GLEs covered by the test),
- scoring the test, and
- sample test items.

When Is the Biology EOC Test Administered?
The Biology EOC **field test** is scheduled for May 2010. Beginning in the 2010–2011 school year, operational tests will be administered to all public school students upon their completion of a Biology course. The Biology EOC test will be administered each May for students on traditional schedules, with an additional administration each December or January for students on block schedules. Exact dates for registration and administration will be published in a *Test Administration Manual* as well as on the home page for End-of-Course testing, www.LouisianaEOC.org.

Who Takes the Biology EOC Test?
The Biology EOC test should be administered to all public school students upon their completion of the following course, which provides content equivalent to Biology.

- Biology—course code 150301

How Is the Biology EOC Test Related to the Louisiana Comprehensive Curriculum?
The Louisiana Comprehensive Curriculum was used as a resource to determine the appropriate content and coverage for the test. However, other curricula developed by local districts and approved by the state that address all GLEs at the appropriate level of rigor will also suitably prepare students for the test. Charts of GLEs eligible for testing are included on pages 4 through 7.

Where May I Find Additional Information about the Biology EOC Assessment?
This *Biology End-of-Course (EOC) Assessment Guide* is posted on the Louisiana Department of Education Web site at www.louisianaschools.net under Testing and on the home page for End-of-Course testing, www.LouisianaEOC.org. Questions or requests for more information should be addressed to the LDE Division of Assessments and Accountability by calling toll-free at 877-453-2721.

Additional Resources
The Louisiana Department of Education (LDE) has developed several resources to assist educators as they prepare students for the Biology EOC test. The following materials are available on the LDE Web site, www.louisianaschools.net:

- *Grade-Level Expectations* (GLEs) *Handbooks*
- Comprehensive Curriculum
- PASS (Practice Assessment/Strengthen Skills) or PASS on Paper
- Released test items from the Graduation Exit Examination (GEE)
- *GEE Assessment Guide*, chapter 3, Science
- Louisiana Instructional Resources Database
- Focused Learning Lessons

The Biology EOC Test

Test Design

The Biology EOC test includes three sessions, as shown in table 1. All sessions will be administered online.

Table 1: Biology EOC Test Sessions

Session	Description	Number of Items	Score Points	Administration Time
1	multiple-choice	23	23	40 minutes
2	short-answer	2	4	20 minutes
3	multiple-choice	23	23	40 minutes
TOTAL		48	50	100 minutes

Any additional multiple-choice items on the operational test are embedded field test items, and student responses to these items do not count toward the student's final score.

The Biology EOC test is not timed. However, each multiple-choice session is designed to be administered in approximately 40 minutes; the short-answer session is designed to be administered in approximately 20 minutes.

Information about additional time needed to prepare computers for testing, read test directions to students, assist students with the log-in process, and accomplish other activities related to test administration is included in the *Test Administration Manual*.

Characteristics of Test Items

Multiple-choice items assess knowledge, conceptual understanding, and application of skills from the Life Science, Earth and Space Science, and Science as Inquiry strands. The items consist of an interrogatory stem followed by four response options (A, B, C, D) and are scored as correct or incorrect.

The Biology EOC test will also include two short-answer items from the Life Science strand. Short-answer items require students to compose an answer, and these items generally require higher-order thinking. A typical short-answer item may require students to develop an idea, demonstrate a problem-solving strategy, or justify an answer based on reasoning or evidence. The items are scored on a 0–2 point scale. Responses that are illegible, incoherent, not written in English, copied text, refusals to respond, insufficient amounts of writing to score, blank, or off-topic will receive a score of 0.

Coverage by Strand and Component

The Biology EOC test is composed of:

- seven components from the Life Science strand
  - The Cell
  - The Molecular Basis of Heredity
  - Biological Evolution
  - Interdependence of Organisms

    - Matter, Energy, and Organization of Living Systems
    - Systems and the Behavior of Organisms
    - Personal and Community Health
- one component from the Earth and Space Science strand
- one component from the Science as Inquiry strand

The seven Life Science components comprise 70 percent of the test and are assessed using both multiple-choice and short-answer items. Consisting of only multiple-choice items, the Earth and Space Science component comprises 12 percent of the test and the Science as Inquiry component, 18 percent.

Table 2: Biology EOC Coverage by Strands and Components

Strand or Component	Approximate Percentage by Component	Approximate Percentage by Strand
Life Science		70
The Cell	11	
The Molecular Basis of Heredity	11	
Biological Evolution	11	
Interdependence of Organisms	8	
Matter, Energy, and Organization of Living Systems	8	
Systems and the Behavior of Organisms	11	
Personal and Community Health	10	
Earth and Space Science		12
Science as Inquiry		18
TOTAL		100

Use of Calculator, Scratch Paper, Online Tools, and Typing Help
Test items will be written to be as self-contained as possible.

Calculators—No calculators will be allowed. Items that require calculations will use simple numbers.
Scratch paper—Students will be allowed to use scratch paper provided by the test administrator.
Online tools—No online tools will be provided.
Typing help—Keystrokes for special symbols are described in table 8.

Scoring
Student responses to multiple-choice items will be computer-scored, and responses to short-answer items will be hand scored. It is expected that scores for all sessions of the Biology EOC test will be available within two to three school days.

Biology Grade-Level Expectations (GLEs)

Eligible GLEs for Biology EOC Tests
The Biology EOC test measures what students are expected to know and be able to do according to Louisiana's Grade-Level Expectations as listed in the Biology course section of the Louisiana Comprehensive Curriculum. Table 4 presents the GLEs for the Life Science components, table 5 lists the GLEs for the Earth and Space Science component, and table 6 lists the GLEs for the Science as Inquiry component.

Sixty-three of these GLEs are eligible for testing as multiple-choice items; however, a given test form will not cover all GLEs. Three Science as Inquiry GLEs are not eligible for inclusion on the EOC Biology assessment, as specified in table 7. In addition, only certain GLEs, as specified in table 4, will be available for short-answer (SA) items.

Explanation of Codes
GLEs are numbered consecutively in each grade level and grouped by strand and thematic category.

Benchmarks (in parentheses in table 4) are coded by strand, grade cluster (E, M, H), and benchmark number. The first term in the code refers to the strand. The second term refers to the grade cluster, and the third term refers to the thematic category and benchmark number. Thematic categories are indicated by letters. Table 3 provides three examples of benchmark codes.

Table 3: Examples of Science Codes

Code	Translation
SI-H-A5	Science as Inquiry strand, High School level, category A, benchmark 5
ESS-H-B2	Earth and Space Science strand, High School level, category B, benchmark 2
LS-H-A6	Life Science strand, High School level, category A, benchmark 6

Table 4: Life Science Component GLEs

GLE	Text of GLE	Assessable as SA
The Cell		
1	Compare prokaryotic and eukaryotic cells (LS-H-A1)	no
2	Identify and describe structural and functional differences among organelles (LS-H-A1)	**yes**
3	Investigate and describe the role of enzymes in the function of a cell (LS-H-A1)	**yes**
4	Compare active and passive cellular transport (LS-H-A2)	**yes**
5	Analyze the movement of water across a cell membrane in hypotonic, isotonic, and hypertonic solutions (LS-H-A2)	**yes**
6	Analyze a diagram of a developing zygote to determine when cell differentiation occurs (LS-H-A3)	no
The Molecular Basis of Heredity		
7	Identify the basic structure and function of nucleic acids (e.g., DNA, RNA) (LS-H-B1)	**yes**
8	Describe the relationships among DNA, genes, chromosomes, and proteins (LS-H-B1)	**yes**
9	Compare mitosis and meiosis (LS-H-B2)	**yes**
10	Analyze pedigrees to identify patterns of inheritance for common genetic disorders (LS-H-B3)	**yes**
11	Calculate the probability of genotypes and phenotypes of offspring given the parental genotypes (LS-H-B3)	**yes**
12	Describe the processes used in modern biotechnology related to genetic engineering (LS-H-B4) (LS-H-B1)	no
13	Identify possible positive and negative effects of advances in biotechnology (LS-H-B4) (LS-H-B1)	no
Biological Evolution		
14	Analyze evidence on biological evolution, utilizing descriptions of existing investigations, computer models, and fossil records (LS-H-C1)	**yes**
15	Compare the embryological development of animals in different phyla (LS-H-C1) (LS-H-A3)	no
16	Explain how DNA evidence and fossil records support Darwin's theory of evolution (LS-H-C2)	**yes**
17	Explain how factors affect gene frequency in a population over time (LS-H-C3)	no
18	Classify organisms from different kingdoms at several taxonomic levels, using a dichotomous key (LS-H-C4)	no
19	Compare characteristics of the major kingdoms (LS-H-C5)	**yes**

Table 4: Life Science Component GLEs (continued)

20	Analyze differences in life cycles of selected organisms in each of the kingdoms (LS-H-C6)	**yes**
21	Compare the structures, functions, and cycles of viruses to those of cells (LS-H-C7)	no
22	Describe the role of viruses in causing diseases and conditions (e.g., AIDS, common colds, smallpox, influenza, warts) (LS-H-C7) (LS-H-G2)	no
Interdependence of Organisms		
23	Illustrate the flow of carbon, nitrogen, and water through an ecosystem (LS-H-D1) (SE-H-A6)	**yes**
24	Analyze food webs by predicting the impact of the loss or gain of an organism (LS-H-D2)	**yes**
25	Evaluate the efficiency of the flow of energy and matter through a food chain/pyramid (LS-H-D2)	**yes**
26	Analyze the dynamics of a population with and without limiting factors (LS-H-D3)	**yes**
27	Analyze positive and negative effects of human actions on ecosystems (LS-H-D4) (SE-H-A7)	**yes**
Matter, Energy, and Organization of Living Systems		
28	Explain why ecosystems require a continuous input of energy from the Sun (LS-H-E1)	no
29	Use balanced equations to analyze the relationship between photosynthesis and cellular respiration (LS-H-E1)	**yes**
30	Explain the role of adenosine triphosphate (ATP) in a cell (LS-H-E2)	**yes**
31	Compare the levels of organization in the biosphere (LS-H-E3)	**yes**
Systems and the Behavior of Organisms		
32	Analyze the interrelationships of organs in major systems (LS-H-F1) (LS-H-E3)	**yes**
33	Compare structure to function of organs in a variety of organisms (LS-H-F1)	**yes**
34	Explain how body systems maintain homeostasis (LS-H-F2)	**yes**
35	Explain how selected organisms respond to a variety of stimuli (LS-H-F3)	**yes**
36	Explain how behavior affects the survival of species (LS-H-F4)	**yes**
Personal and Community Health		
37	Explain how fitness and health maintenance can result in a longer human life span (LS-H-G1)	no
38	Discuss mechanisms of disease transmission and processes of infection (LS-H-G2) (LS-H-G4)	**yes**

Table 4: Life Science Component GLEs (continued)

39	Compare the functions of the basic components of the human immune system (LS-H-G3)	**yes**
40	Determine the relationship between vaccination and immunity (LS-H-G3)	no
41	Describe causes, symptoms, treatments, and preventions of major communicable and noncommunicable diseases (LS-H-G4)	**yes**
42	Summarize the uses of selected technological developments related to the prevention, diagnosis, and treatment of diseases or disorders (LS-H-G5)	**yes**

Table 5: Earth and Space Science Component GLEs

GLE	Text of GLE	Assessable as SA
1	Describe what happens to the solar energy received by Earth every day (ESS-H-A1)	no
2	Trace the flow of heat energy through the processes in the water cycle (ESS-H-A1)	no
3	Describe the effect of natural insulation on energy transfer in a closed system (ESS-H-A1)	no
13	Explain how stable elements and atoms are recycled during natural geologic processes (ESS-H-B1)	no
15	Identify the sun-driven processes that move substances at or near Earth's surface (ESS-H-B2)	no
17	Determine the relative ages of rock layers in a geologic profile or cross section (ESS-H-C2)	no
18	Use data from radioactive dating techniques to estimate the age of earth materials (ESS-H-C2)	no
22	Analyze data related to a variety of natural processes to determine the time frame of the changes involved (e.g., formation of sedimentary rock layers, deposition of ash layers, fossilization of plant or animal species) (ESS-H-C5)	no

Table 6: Science as Inquiry Component GLEs

GLE	Text of GLE	Assessable as SA
1	Write a testable question or hypothesis when given a topic (SI-H-A1)	no
2*	Describe how investigations can be observation, description, literature survey, classification, or experimentation (SI-H-A2)	no
3	Plan and record step-by-step procedures for a valid investigation, select equipment and materials, and identify variables and controls (SI-H-A2)	no
4	Conduct an investigation that includes multiple trials and record, organize, and display data appropriately (SI-H-A2)	no
5	Utilize mathematics, organizational tools, and graphing skills to solve problems (SI-H-A3)	no
6*	Use technology when appropriate to enhance laboratory investigations and presentations of findings (SI-H-A3)	no
7	Choose appropriate models to explain scientific knowledge or experimental results (e.g., objects, mathematical relationships, plans, schemes, examples, role-playing, computer simulations) (SI-H-A4)	no
8	Give an example of how new scientific data can cause an existing scientific explanation to be supported, revised, or rejected (SI-H-A5)	no
9	Write and defend a conclusion based on logical analysis of experimental data (SI-H-A6) (SI-H-A2)	no
10	Given a description of an experiment, identify appropriate safety measures (SI-H-A7)	no
11	Evaluate selected theories based on supporting scientific evidence (SI-H-B1)	no
12*	Cite evidence that scientific investigations are conducted for many different reasons (SI-H-B2)	no
13	Identify scientific evidence that has caused modifications in previously accepted theories (SI-H-B2)	no
14	Cite examples of scientific advances and emerging technologies and how they affect society (e.g., MRI, DNA in forensics) (SI-H-B3)	no
15	Analyze the conclusion from an investigation by using data to determine its validity (SI-H-B4)	no
16	Use the following rules of evidence to examine experimental results (a) Can an expert's technique or theory be tested, has it been tested, or is it simply a subjective, conclusive approach that cannot be reasonably assessed for reliability? (b) Has the technique or theory been subjected to peer review and publication? (c) What is the known or potential rate of error of the technique or theory when applied? (d) Were standards and controls applied and maintained? (e) Has the technique or theory been generally accepted in the scientific community? (SI-H-B5) (SI-H-B1) (SI-H-B4)	no

***** *These GLEs will not be assessed on the Biology EOC test.*

Table 7: Science as Inquiry GLEs Excluded from the EOC Biology Assessment

GLE	Text of GLE
2	Describe how investigations can be observation, description, literature survey, classification, or experimentation (SI-H-A2)
6	Use technology when appropriate to enhance laboratory investigations and presentations of findings (SI-H-A3)
12	Cite evidence that scientific investigations are conducted for many different reasons (SI-H-B2)

Sample Items for Biology EOC Tests

The sample multiple-choice and short-answer items on the pages that follow are similar in content and format to those that will be included on the Biology EOC test.

Sample Multiple-Choice Items
An asterisk (*) indicates the correct response to each multiple-choice item.

This item measures aspects of Life Science GLE 4—*Compare active and passive cellular transport (LS-H-A2).*

In which situation would passive transport **most likely** be used to remove a substance from inside a cell?

A. The substance is composed of positive ions.

B. The substance is composed of large protein molecules.

*C. The concentration of the substance is lower outside the cell than inside the cell.

D. The concentration of the substance is higher outside the cell than inside the cell.

This item measures aspects of Life Science GLE 16—*Explain how DNA evidence and fossil records support Darwin's theory of evolution (LS-H-C2).*

Which is the **best** evidence that two species have a common ancestor?

A. The two species have the same diet.

B. The two species live in the same habitat.

*C. The two species' DNA sequences are 90% identical.

D. The two species' skeletal structures are 90% identical.

This item measures aspects of Life Science GLE 23—*Illustrate the flow of carbon, nitrogen, and water through an ecosystem (LS-H-D1) (SE-H-A6).*

Which processes **both** increase the amount of carbon dioxide in the atmosphere?

A. photosynthesis and volcanic activity

B. photosynthesis and burning fossil fuels

C. cellular respiration and deposition of sediments

*D. cellular respiration and decomposition of organic matter

This item measures aspects of Life Science GLE 30—*Explain the role of adenosine triphosphate (ATP) in a cell (LS-H-E2).*

Photosynthesis includes processes that require light and processes that do not. Which statement **best** explains why ATP is used in both processes?

A. ATP is a building block of sugars and stores energy in plant cells.

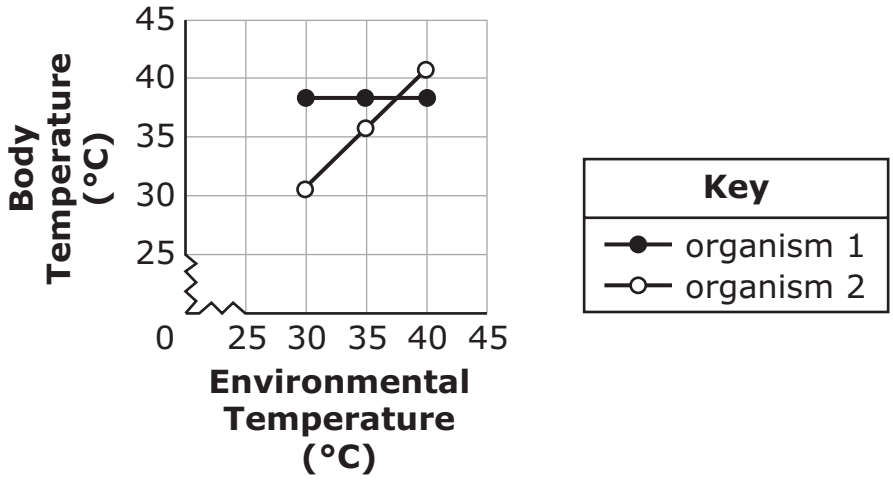
B. ATP collects chemical energy from plant cells and produces light energy to build sugars.

*C. ATP stores energy that plant cells absorb from light and releases the energy when it is needed to produce sugars.

D. ATP is an enzyme that increases the rate at which sugars are made and reduces the amount of energy that plant cells need.

This item measures aspects of Life Science GLE 34—*Explain how body systems maintain homeostasis (LS-H-F2).*

The graph below compares the body temperatures of two organisms in relation to different environmental temperatures.



Which statement **best** predicts how each organism will respond to environmental temperatures below 30°C?

*A. Organism 1 will increase muscular activity to maintain homeostasis, and organism 2 will decrease muscular activity because it is cold-blooded.

B. Organism 1 will decrease muscular activity to maintain homeostasis, and organism 2 will increase muscular activity because it is cold-blooded.

C. Organism 1 will increase digestive activity to maintain homeostasis, and organism 2 will decrease digestive activity because it is warm-blooded.

D. Organism 1 will decrease digestive activity to maintain homeostasis, and organism 2 will increase digestive activity because it is warm-blooded.

This item measures aspects of Earth and Space Science GLE 22—*Analyze data related to a variety of natural processes to determine the time frame of the changes involved (e.g., formation of sedimentary rock layers, deposition of ash layers, fossilization of plant or animal species) (ESS-H-C5).*

A scientist observed several different fossils in a rock layer. Based on this observation, which conclusion is **best** for the scientist to make?

A. The fossils are composed of lava that cooled around several organisms.

*B. The fossils formed about the same time as the rock layer in which they were found.

C. The fossils formed after heat and pressure changed the type of rock in the rock layer.

D. The fossils are composed of the same material as the organisms from which they formed.

This item measures aspects of Science as Inquiry GLE 3—*Plan and record step-by-step procedures for a valid investigation, select equipment and materials, and identify variables and controls (SI-H-A2).*

Students studying the plant *Brassica rapa* want to know at what percent of carbon dioxide (CO_2) in the air *Brassica rapa* plants will grow fastest. Which table shows an experimental design that will **best** answer the question?

A.

Plant	CO_2 (% in air)	Light (hrs/day)	Water (mL/day)	Initial mass (kg)
1	0.03	12	50	0.5
2	0.03	12	50	0.6
3	0.03	12	50	0.7

B.

Plant	CO_2 (% in air)	Light (hrs/day)	Water (mL/day)	Initial mass (kg)
1	0.03	8	50	0.5
2	0.03	10	50	0.6
3	0.03	12	50	0.7

*C.

Plant	CO_2 (% in air)	Light (hrs/day)	Water (mL/day)	Initial mass (kg)
1	0.03	12	50	0.5
2	0.04	12	50	0.5
3	0.05	12	50	0.5

D.

Plant	CO_2 (% in air)	Light (hrs/day)	Water (mL/day)	Initial mass (kg)
1	0.03	8	50	0.5
2	0.04	10	50	0.5
3	0.05	12	50	0.5

Sample Short-Answer (SA) Item and Scoring Rubric

A sample short-answer (SA) item follows, along with its scoring rubric. A maximum of 2 points is possible for short-answer items on the Biology EOC test.

This item measures aspects of Life Science GLE 11—*Calculate the probability of genotypes and phenotypes of offspring given the parental genotypes (LS-H-B3).*

Cross-pollination of plants is used to develop hybrids with desirable traits. One desirable trait is frost resistance. If the genotypes of hybrids are all heterozygous for frost resistance, they will all be frost-resistant.

Determine the phenotypes **and** genotypes of two parent plants that would have only heterozygous offspring (Ff).

Points Assigned

- 2 points for a correct response (e.g., "One parent plant is frost-resistant (FF) and one parent plant is not frost resistant (ff)")

OR

- 1 point for a partially correct response (e.g., "The parent plants are homozygous (FF x ff)")

Scoring Rubric

Score	Description
2	2 points
1	1 point **OR** Minimal understanding of the probabilities of genotypes.
0	The student's response is incorrect, irrelevant, too brief to evaluate, or blank.

Appendices

Item Development Process
Test items for the Biology EOC test have been derived from the following source:

- Professional test developers under contract with the state

Items are reviewed and approved by Louisiana educators through state-level item review committees. All EOC test items are developed to align with the GLEs from the Louisiana Comprehensive Curriculum for the Biology course, which include forty-two Life Science GLEs, eight Earth and Space Science GLEs, and thirteen Science as Inquiry GLEs.

Test Accommodations
Test accommodations are provided to minimize the effects of a disability to ensure that a student can demonstrate the degree of achievement he or she actually possesses. An accommodation is a change in the setting of the test administration, the timing, scheduling, presentation format, and/or method of response to the assessment. Not all students with disabilities will need test accommodations, but many will need them to provide a valid and accurate measure of their abilities. The goal in using accommodations is to give students with disabilities an equal opportunity in assessment, not to give students with disabilities an unfair advantage over other students or to subvert or invalidate the purpose of the tests. The accommodation should allow the test score to reflect a student's proficiency in the area tested, without the interference of his or her disability.

Accommodations are available to qualifying students who are classified as IDEA Special Education, Section 504, and Limited English Proficient (LEP). Special online test forms are available to students who are assigned *Large Print* or *Tests Read Aloud* accommodations. Braille test forms also are available. Other allowed accommodations are *Assistive Technology*, *Communication Assistance*, *Individual/Small Group Administration*, and *Extended Time*. Test accommodations should not be different from or in addition to the accommodations provided in the classroom during instruction and as indicated on the student's Individualized Education Program (IEP) or Section 504 plan (Individualized Education Plan/IAP). Testing and instructional accommodations must be based on each student's needs as documented in the student's IEP or IAP. Students classified as LEP may receive the following accommodations if they are used routinely in the students' classroom instruction and assessment: *Extended Time*, *Individual/Small Group Administration*, *Provision of English/Native Language Word-to-Word Dictionary (No Definitions)*, *Test Administered by ESL Teacher or by Individual Providing Language Services*, and *Tests Read Aloud*.

Since accommodations used during state assessments must be an ongoing part of classroom instruction and assessment, it is crucial that general educators be knowledgeable about accommodations, use them routinely in the classroom, and be prepared to implement the use of approved accommodations during state assessments.

For a list of approved test accommodations that may be used for students with disabilities and suggestions for implementing accommodations during assessment, refer to the *Test*

Administration Manual, which will be available approximately one month prior to testing.

Technology Requirements
The operational Biology EOC test is administered online only, except for the Braille test; therefore, schools will need to ensure that appropriate technology requirements are met. The *Test Administration Manual* (available approximately one month prior to testing) provides detailed instructions on how to prepare students and computer labs for online testing.

Biology EOC Glossary
This brief glossary includes definitions of specialized vocabulary associated with the EOC assessments.

- *accommodation:* a change in the setting of the test administration, the timing, scheduling, presentation format, and/or method of response to the assessment
- *assessment:* a test designed to measure knowledge, skills, or abilities
- *blueprint:* a table or chart that identifies how items on an assessment will be distributed across strands/standards or Grade-Level Expectations
- *item*: a question or prompt that is designed to measure particular knowledge, skills, or abilities
- *multiple-choice (MC) item:* an item in which students select a correct answer from among more than one response option
- *response options:* answer choices in a multiple-choice test item
- *rubric:* a set of rules or criteria for scoring student responses to short-answer items
- *short-answer (SA) item*: an open-ended item in which students write their own responses and are scored against a rubric

Biology EOC Typing Help

On the short-answer portion of the Biology EOC test, students may need to use the following keystrokes to enter special symbols within their responses. The table below shows the shortcuts that students will have available for their use during the Biology EOC test.

Table 8: Keystrokes for Special Symbols

1. If the Response Includes:	2. Type This Instead	3. Example
Na^+ superscript	^ "caret" symbol (SHIFT + 6)	Na^+
H_2O subscript	2 number	H2O
20°C degree symbol	degree the word "degree"	20 degrees C
Bb × Bb cross	x space, letter x, space	Bb x Bb
→ reaction arrow	->dash, followed by greater than sign	Na + Cl -> NaCl
⇆ reversible reaction arrows	<=> less than sign, followed by equals sign, followed by greater than sign	H + I <=> HI