



Arkansas Comprehensive Testing, Assessment, and Accountability Program

RELEASED ITEM
BOOKLET
Biology
End-of-Course Examinations
2010–2011 Administrations

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Arkansas Department of Education

TABLE OF CONTENTS

	PAGE(S)
PART I	
Overview	4
Scoring Student Responses to Biology Open-Response Items	5
PART II	
Mid-Year Released Biology Items	6
Spring Released Biology Items	18
PART III	
Curriculum Framework	31–35
PART IV	
Item Correlation with Curriculum Framework	36–39
Mid-Year Released Biology Items	36
Spring Released Biology Items.....	37
Mid-Year Non-Released Biology Items.....	38
Spring Non-Released Biology Items.....	39

PART I OVERVIEW

The criterion-referenced tests implemented as part of the **Arkansas Comprehensive Testing, Assessment, and Accountability Program** (ACTAAP) are being developed in response to Arkansas Legislative Act 35, which requires the State Board of Education to develop a comprehensive testing program that includes assessment of the challenging academic content standards defined by the Arkansas Curriculum Frameworks.

As part of this program, students in Arkansas public schools in 2011 who had completed or were completing Biology by the end of first semester participated in the Mid-Year Biology End-of-Course Examination. Students in Arkansas public schools who had completed or were completing Biology by the end of the spring semester participated in the Spring Biology End-of-Course Examination.

This Released Item Booklet for the Biology End-of-Course Examinations contains test questions or items that were asked of students during the 2010–2011 operational administrations. The test items included in Part II of this booklet are some of the items that contributed to the student performance results for these administrations.

Students were given approximately an hour and a half each day to complete assigned test sessions during the two days of Mid-Year testing. Students were given approximately two hours each day to complete assigned test sessions during the two days of Spring testing. All of the multiple-choice items within this booklet have the correct response marked with an asterisk (*).

The development of the Biology End-of-Course Examinations was based on the *Arkansas Biology Science Curriculum Framework*. This framework has distinct levels: Strands to be taught in concert, Content Standards within each Strand, and Student Learning Expectations within each Content Standard. An abridged version of the *Arkansas Biology Science Curriculum Framework* can be found in Part III of this booklet. It is important to note that this abridged version lists only the predominant Strand, Content Standard, and Student Learning Expectation associated with each item. However, since many key concepts within the *Arkansas Biology Science Curriculum Framework* are interrelated, there may be many cases in which there are other item correlations or associations across Strands, Content Standards, and Student Learning Expectations.

Part IV of the Released Item Booklet contains a tabular listing of the Strand, Content Standard, and Student Learning Expectation that each question was designed to assess. The multiple-choice and open-response items found on the Biology End-of-Course Examinations were developed in close association with the Arkansas education community. Arkansas teachers participated as members of the Biology Content Advisory Committee, providing routine feedback and recommendations for all items. The number of items associated with specific Strands, Content Standards, and Student Learning Expectations was based on approximate proportions suggested by the Content Advisory Committee, and their recommendations were accommodated to the greatest extent possible given the overall test design. Part IV of the Released Item Booklet provides Arkansas educators with specific information on how Biology End-of-Course Examination items align or correlate with the *Arkansas Biology Science Curriculum Framework* to provide models for classroom instruction.

PART I SCORING STUDENT RESPONSES TO BIOLOGY OPEN-RESPONSE ITEMS

While multiple-choice items are scored by machine to determine if the student chose the correct answer from four options, responses to open-response items must be scored by trained “readers” using a pre-established set of scoring criteria.

The Arkansas Biology Rangeland Committee assisted in the development of the scoring criteria. The committee comprises active Arkansas educators with expertise in science education.

Reader Training

Before readers are allowed to begin assigning scores to any student responses, they go through intensive training. The first step in that training is for the readers to read the Biology open-response items as they appear in the test booklet and to respond—just as the student test takers are required to do. This step gives the readers some insight into how the students might have responded. The next step is the readers’ introduction to the scoring rubric. All of the specific requirements of the rubric are explained by the Scoring Director who has been specifically trained to lead the scoring group. Then responses (anchor papers) that illustrate the score points of the rubric are presented to the readers and discussed. The goal of this discussion is for the readers to understand why a particular response (or type of response) receives a particular score. After discussion of the rubric and anchor papers, readers practice scoring sets of responses that have been pre-scored and selected for use as training papers. Detailed discussion of the responses and the scores they receive follows.

After three or four of these practice sets, readers are given “qualifying rounds.” These are additional sets of pre-scored papers, and, in order to qualify, each reader must score in exact agreement on at least 80% of the responses and have no more than 5% non-adjacent agreement on the responses. Readers who do not score within the required rate of agreement are not allowed to score the Biology End-of-Course Examination responses.

Once scoring of the actual student responses begins, readers are monitored constantly throughout the project to ensure that they are scoring according to the criteria. Daily and cumulative statistics are posted and analyzed, and Scoring Directors or Team Leaders reread selected responses scored by the readers. These procedures promote reliable and consistent scoring. Any reader who does not maintain an acceptable level of agreement is dismissed from the project.

Scoring Procedures

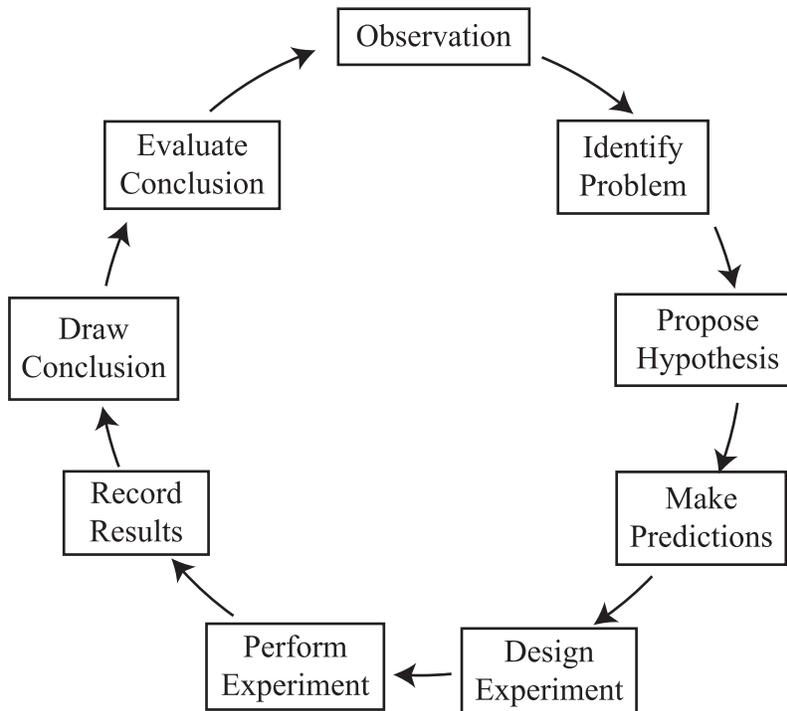
All student responses to the Biology End-of-Course Examination open-response test items are scored independently by two readers. Those two scores are compared, and responses that receive scores that are non-adjacent (a “1” and a “3,” for example) are scored a third time by a Team Leader or the Scoring Director for resolution.

PART II MID-YEAR RELEASED BIOLOGY ITEMS

- Which subunit makes up a protein molecule?
 - fatty acids
 - nucleotides
 - *C. amino acids
 - monosaccharides
- Which describes a group of organisms that belong to the same species and live in the same area?
 - biosphere
 - *B. population
 - ecosystem
 - community
- Which theory proposes that pathogenic microorganisms can invade other organisms and initiate an immune response?
 - cell theory
 - gene theory
 - *C. germ theory
 - unifying theory
- Which list shows the phases of mitosis in the **correct** order?
 - prophase, metaphase, anaphase, telophase
 - B. prophase, anaphase, metaphase, telophase
 - C. anaphase, metaphase, prophase, telophase
 - D. metaphase, prophase, telophase, anaphase
- The offspring of two chickens have a 1 out of 4 chance of being white, which is a recessive trait. Which cross could produce the probability of such offspring?
 - YY x YY
 - YY x Yy
 - *C. Yy x Yy
 - yy x yy
- The presence of which cell structure can be used to differentiate between Bacteria and Eukarya?
 - *A. nucleus
 - cell wall
 - ribosome
 - plasma membrane
- A fish species lives in the coral-like tentacles of a primitive invertebrate. Scientists believe that fish droppings and scraps of food provide nutrients for the invertebrate. What additional information would make this a mutualistic relationship?
 - A. The fish protects the invertebrate from predators.
 - *B. The fish uses the invertebrate as a nest for their eggs.
 - C. The invertebrate reproduces less often because of the fish.
 - D. The invertebrate grows more slowly in the presence of the fish.

PART II MID-YEAR RELEASED BIOLOGY ITEMS

8. The steps shown below will be taken by a student when planning a science fair project.



At which part of the process should the student identify and develop specific safety procedures?

- A. Observation
- B. Make Predictions
- *C. Design Experiment
- D. Propose Hypothesis

9. Which blood genotype is an example of codominant inheritance?

- A. $I^B i$
- B. $I^A i$
- C. $I^A I^A$
- *D. $I^A I^B$

10. Into which domain would one classify bacteria that live in hydrothermal vents?

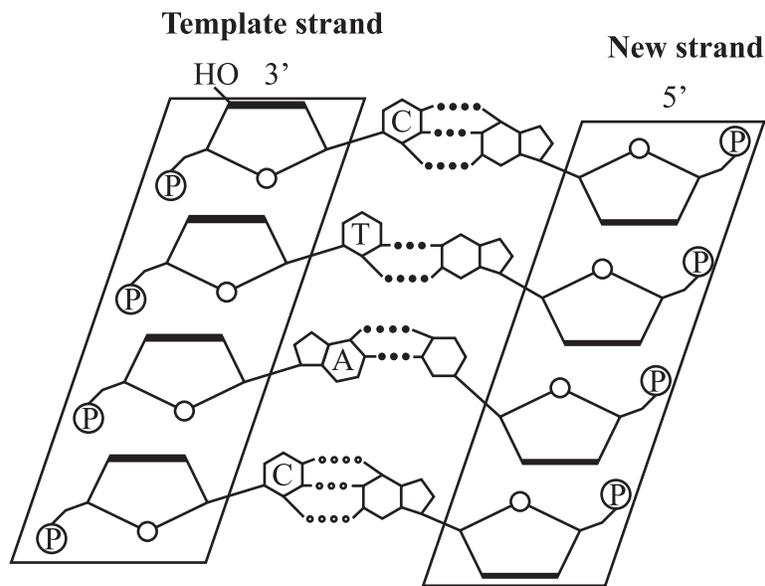
- *A. Archaea
- B. Bacteria
- C. Eukarya
- D. Extrema

PART II MID-YEAR RELEASED BIOLOGY ITEMS

11. In which set is a biotic factor paired with an abiotic factor?
- *A. producers and sunlight
 - B. decomposers and plants
 - C. herbivores and carnivores
 - D. temperature and humidity
12. Which set of organelles would be found in both human cells and plant cells?
- A. chloroplast, nucleus, and cell wall
 - B. nucleus, endoplasmic reticulum, and cell wall
 - *C. mitochondria, nucleus, and endoplasmic reticulum
 - D. mitochondria, chloroplasts, endoplasmic reticulum, and centrioles
13. Which adaptation allowed plants such as pine trees to have an increased height over smaller plants like moss?
- *A. vascular tissue
 - B. sexual reproduction
 - C. production of a seed
 - D. alternation of generations
14. Which lists the components of an RNA nucleotide?
- *A. ribose, phosphate, uracil
 - B. ribose, phosphate, thymine
 - C. deoxyribose, phosphate, uracil
 - D. deoxyribose, phosphate, cytosine
15. A lemon tree is a type of seed plant. What makes a lemon tree **different** from cycads and gymnosperms?
- A. It has seeds.
 - *B. It forms fruit.
 - C. It produces pollen.
 - D. It has vascular tissue.

PART II MID-YEAR RELEASED BIOLOGY ITEMS

16. The illustration below shows a step in DNA replication.



Starting at the top, which list shows the identity of the bases of the new strand?

- A. A, G, T, A
 - *B. G, A, T, G
 - C. G, A, U, G
 - D. A, G, U, A
-
17. Which two types of molecules are found in all viruses and all protists?
- A. lipids and nucleic acids
 - B. carbohydrates and lipids
 - *C. nucleic acids and proteins
 - D. carbohydrates and proteins

PART II MID-YEAR RELEASED BIOLOGY ITEMS

18. Which of these is converted in both the mitochondria and the chloroplasts?

- A. DNA
- *B. energy
- C. protein
- D. nutrients

19. Which statement describes a structural difference between DNA and RNA?

- A. DNA is a single strand and RNA is a double strand.
- *B. DNA has thymine nucleotides and RNA has uracil nucleotides.
- C. DNA has cytosine amino acids and RNA has guanine amino acids.
- D. DNA is made up of nucleotides and RNA is made up of amino acids.

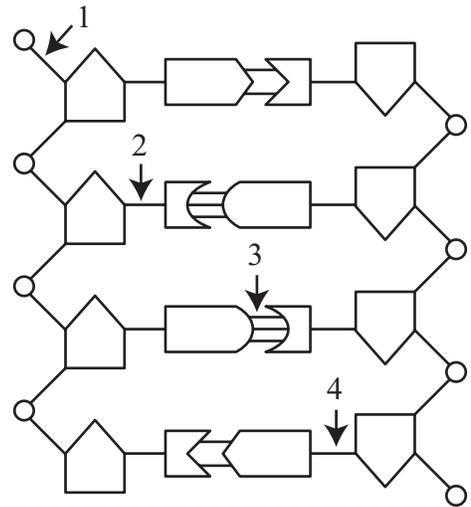
20. Gene therapy is the insertion of genes into cells to replace a defective gene in order to cure a disease or condition. Gene therapy is possible due to work done on developing which of the following theories?

- A. cell theory
- B. germ theory
- C. evolutionary theory
- *D. chromosome theory

21. An amoeba can take in a large food particle by surrounding it and creating a vacuole. What is this method of feeding called?

- A. lysis
- B. osmosis
- C. exocytosis
- *D. phagocytosis

22. The graphic below represents a segment of DNA.



Which bond must be broken if DNA replication is to occur?

- A. 1
- B. 2
- *C. 3
- D. 4

PART II MID-YEAR RELEASED BIOLOGY ITEMS

23. Which science term represents a testable explanation of a natural phenomenon?
- A. law
 - *B. theory
 - C. analysis
 - D. inference
24. Which structure can be used to differentiate eukaryotic cells from prokaryotic cells?
- *A. nucleus
 - B. ribosome
 - C. nucleic acid
 - D. plasma membrane
25. Under which condition might the theory of evolution be modified?
- A. Additional empirical data shows natural selection occurring today.
 - B. Scientists find data collected by a scientist who lived before Darwin.
 - C. Peer review of Darwin's earliest studies is published in a new journal.
 - *D. Other studies on natural selection show new evidence about how it works.
26. In which part of the water cycle does water change from a liquid to a gas?
- A. infiltration
 - B. sublimation
 - C. precipitation
 - *D. transpiration
27. Which **correctly** describes fungi?
- A. multicellular autotrophic eukaryotes that get their energy from sunlight and can only reproduce asexually
 - B. unicellular autotrophic eukaryotes that get their energy from sunlight and can reproduce both sexually and asexually
 - C. multicellular heterotrophic eukaryotes that get their energy from consuming other organisms and can only reproduce sexually
 - *D. multicellular or unicellular heterotrophic eukaryotes that get their energy from absorption and can reproduce both sexually and asexually

PART II MID-YEAR RELEASED BIOLOGY ITEMS

28. A biology class is conducting a year-long field study on animals in a nearby pond.

The chart below shows each group's topic.

Group	Topic
I	Competition among turtles for mates
II	The predator-prey relationship between turtles and fish
III	Length of time required by frogs to complete metamorphosis
IV	The effects of water temperature on the hatching success of toad eggs

Which group will provide the **most** information about a community?

- A. Group I
- *B. Group II
- C. Group III
- D. Group IV

-
29. Which is a biotic factor affecting an ecosystem?

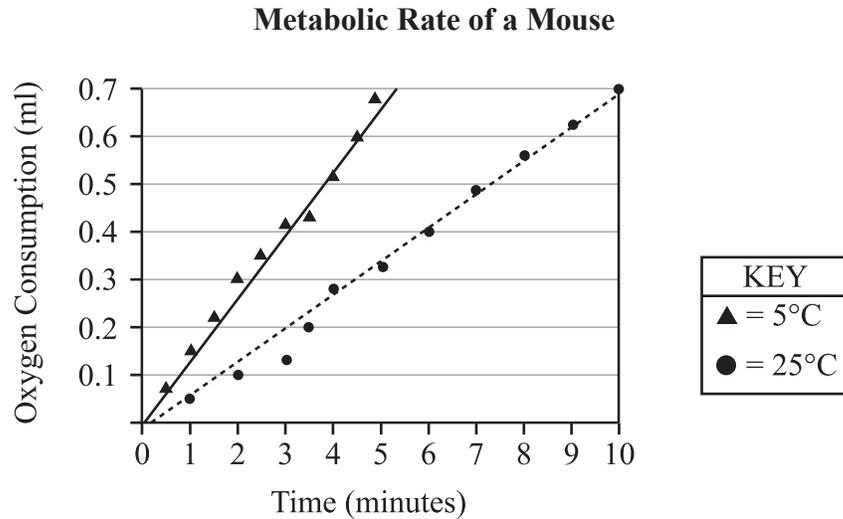
- A. pH of rain
- B. daily temperature
- *C. types of vegetation
- D. average precipitation

30. People once believed that maggots were created from spoiled meat. Then, a scientist hypothesized that flies laid eggs, which produced maggots on the meat. To test his idea, he left pieces of meat out in covered and uncovered jars. What is the dependent variable in his experiment?

- A. the type of meat
- B. the size of jars
- C. the number of flies
- *D. the presence of maggots

PART II MID-YEAR RELEASED BIOLOGY ITEMS

- A. The graph below shows the metabolic rate of a mouse by measuring its oxygen consumption at two temperatures.



1. Identify the dependent and independent variables in this study.
2. What conclusion can be drawn about the effect of temperature on oxygen consumption?
3. Based on your answer in Part 2, explain why temperature has this effect.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

PART II MID-YEAR RELEASED BIOLOGY ITEMS

Item A Scoring Rubric—2011 Biology

Part	Points
1	1 point: identifies an independent variable identifies the dependent variable
2	1 point: explains the effect temperature has on oxygen consumption
3	1 point: explains why temperature has this effect

Score	Description
4	The student earns 4 points. The response shows a <i>complete understanding</i> of independent and dependent variables and homeostasis.
3	The student earns 3 points. The response shows a <i>nearly complete understanding</i> of independent and dependent variables and homeostasis. The response correctly addresses three out of the four tasks.
2	The student earns 2 points. The response shows a <i>limited understanding</i> of independent and dependent variables and homeostasis. The response correctly addresses two out of the four tasks.
1	The student earns 1 point. The response shows a <i>minimum understanding</i> of independent and dependent variables and homeostasis. The response correctly addresses one out of the four tasks.
0	The student earns 0 points. The response shows <i>insufficient understanding</i> of independent and dependent variables and homeostasis. The response, if any, contains major errors or may be entirely irrelevant or incoherent.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

PART II MID-YEAR RELEASED BIOLOGY ITEMS

SOLUTION AND SCORING

Independent and Dependent Variables

Part 1: Dependent Variable – Oxygen Consumption
Independent Variable – Time **or** Temperature

Part 2: At the lower temperature, oxygen consumption occurs at a faster rate.

or

At the higher temperature, oxygen consumption occurs at a slower rate.

Part 3: More oxygen is consumed because more oxygen is used (cellular respiration) in order for the mouse to maintain its body temperature. (thermoregulation, homeostasis)

PART II MID-YEAR RELEASED BIOLOGY ITEMS

B. Bacteria can be beneficial or harmful.

1. Identify two beneficial effects of bacteria.
2. Identify two harmful effects of bacteria.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

Item B Scoring Rubric—2011 Biology

Part	Points	
1	1 point: 1 point:	identifies one positive outcome of bacterial action identifies a second positive outcome of bacterial action
2	1 point: 1 point:	identifies one negative outcome of bacterial action identifies a second negative outcome of bacterial action

Score	Description
4	The student earns 4 points. The response shows a <i>complete understanding</i> of the importance of bacteria. The response describes two positive and two negative outcomes of bacterial action.
3	The student earns 3 points. The response shows a <i>nearly complete understanding</i> of the importance of bacteria. The response correctly addresses three out of the four tasks.
2	The student earns 2 points. The response shows a <i>limited understanding</i> of the importance of bacteria. The response correctly addresses two out of the four tasks.
1	The student earns 1 point. The response shows a <i>minimum understanding</i> of the importance of bacteria. The response correctly addresses one out of the four tasks.
0	The student earns 0 points. The response shows <i>insufficient understanding</i> of the importance of bacteria. The response, if any, contains major errors or may be entirely irrelevant or incoherent.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

PART II MID-YEAR RELEASED BIOLOGY ITEMS

SOLUTION AND SCORING

Beneficial and Harmful Effects of Bacteria

Part	Points	
1	2 points	<p><u>Beneficial Effects</u></p> <p>Food Production: yogurt, sour cream, buttermilk, cheese, wine, sauerkraut, pickles, olives, soy sauce, vinegar</p> <p>Decomposition of organic matter: dead organisms</p> <p>Decomposition of waste: septic tanks, sewage treatment</p> <p>Bioremediation: clean up oil or chemical spills</p> <p>Nitrogen Fixation: convert atmospheric nitrogen to ammonia</p> <p>Transgenic bacteria are used to produce:</p> <ul style="list-style-type: none"> insulin some antibiotics human growth hormone interferon Hepatitis B vaccine <p>Replacement for chemical pesticides</p> <p>Preventing pathogens:</p> <ul style="list-style-type: none"> normal flora of the intestines lactic acid bacteria in plant roots <p>Fuel production:</p> <ul style="list-style-type: none"> decompose garbage and sewage to produce methane nitrogen fixing bacteria are used to produce hydrogen gas
2	2 points	<p><u>Harmful Effects</u></p> <p>Pathogenic: cause disease in humans or animals or plants</p> <p>Spoilage: food or crops</p> <p>Toxins: some bacteria produce toxins that can be deadly</p> <p>Tooth decay</p> <p>Contamination of water</p>

PART II SPRING RELEASED BIOLOGY ITEMS

1. During a lab investigation, a container is heated on a hot plate. Which is the safest way to check to see if the container is cool enough to be picked up?
 - A. Unplug the hot plate using tongs.
 - B. Use the wafting technique to sense temperature.
 - C. Splash cold water on the container before handling.
 - *D. Hold the back of one hand close to the container to sense the heat.

2. Organisms from which kingdom can cause amoebic dysentery?
 - A. Fungi
 - B. Plantae
 - *C. Protista
 - D. Animalia

3. What is an advantage of crossing over during meiosis?
 - *A. It increases genetic variations.
 - B. It decreases genetic mutations.
 - C. It keeps maternal and paternal chromosomes intact.
 - D. It allows dominant genes to be expressed more often.

4. Which group is highest in the hierarchy of life and thus includes the others?
 - A. organism
 - B. population
 - *C. ecosystem
 - D. community

PART II SPRING RELEASED BIOLOGY ITEMS

5. Below is an example of a segment of a natural cycle.



Which cycle is represented by this segment?

- A. water
- *B. nitrogen
- C. phosphate
- D. carbon dioxide

6. Which group of vertebrates is warm-blooded?

- A. fish
- *B. birds
- C. reptiles
- D. amphibians

7. Which component is found in DNA but **not** in RNA?

- A. hydrogen-bonded pairs
- B. sugar-phosphate groups
- C. single-stranded backbone
- *D. adenine-thymine base pair

8. Which describes the difference between pure science and applied science?

- A. Pure science attempts to solve practical problems.
- *B. Applied science attempts to solve practical problems.
- C. Engineering would be an example of pure science.
- D. Basic cell research would be an example of applied science.

9. What would be the result if the number of chromosomes in sex cells were **not** reduced by half through meiosis?

- A. Offspring would only receive chromosomes from the male parent.
- B. Offspring would only receive chromosomes from the female parent.
- C. Offspring would receive one copy of the chromosomes from each parent.
- *D. Offspring would receive two copies of the chromosomes from each parent.

PART II SPRING RELEASED BIOLOGY ITEMS

10. Which describes a change of alleles in a population over time?
- A. relative frequency
 - *B. biological evolution
 - C. incomplete dominance
 - D. independent assortment
11. A microscopic, multicellular organism gets its nutrients through absorption from its environment and reproduces by spores. To which category does this organism **most** likely belong?
- A. plant
 - *B. fungi
 - C. animal
 - D. bacteria
12. When Mendel crossed tall heterozygous plants, what results did he observe in the next generation?
- A. 100% tall plants
 - B. 100% medium plants
 - *C. 75% tall plants and 25% short plants
 - D. 50% tall plants and 50% short plants
13. Which biome has the greatest amount of biodiversity?
- A. boreal forest
 - B. tropical savanna
 - *C. tropical rain forest
 - D. temperate grasslands
14. Which property of an enzyme and its substrate is complementary?
- A. pH
 - B. color
 - *C. shape
 - D. temperature
15. Which question could a student investigate to determine the effects of a biotic factor on a pond community?
- *A. How does the number of predators affect the fish population?
 - B. How do nitrogen levels affect the amount of algae in the pond?
 - C. How does water temperature affect the respiration rate of frogs?
 - D. How does the pH of water affect the hatching of mosquito eggs?
16. Why is it important to design experiments that can be reproduced?
- A. to manipulate the data
 - B. to produce favorable results
 - C. to control all of the variables
 - *D. to ensure reliability of the conclusions
17. Which technology allows scientists to track bird migration patterns through Arkansas?
- A. clipping bird wings
 - *B. capturing and banding birds
 - C. distributing bird-hunting licenses
 - D. following bird flocks with helicopters or airplanes

PART II SPRING RELEASED BIOLOGY ITEMS

18. Which statement is true about DNA and RNA?
- A. Both have a single strand of nucleotides.
 - B. Both have a double strand of nucleotides.
 - *C. Both have a phosphate and sugar backbone.
 - D. Both are involved in the translation of genetic material.
19. How do exergonic reactions differ from endergonic reactions?
- A. Exergonic reactions absorb energy, while endergonic reactions release energy.
 - *B. Exergonic reactions release energy, while endergonic reactions absorb energy.
 - C. Exergonic reactions occur only in plants, while endergonic reactions occur only in animals.
 - D. Exergonic reactions produce carbon dioxide, while endergonic reactions require carbon dioxide.

20. Which **best** explains why bacteria are classified as living and viruses are classified as nonliving?
- A. Bacteria are heterotrophic, while viruses are autotrophic.
 - *B. Bacteria are able to reproduce on their own, while viruses cannot.
 - C. Bacteria contain cellular organelles, while viruses contain nucleic acids.
 - D. Bacteria require sunlight to survive, while viruses can live with or without sunlight.

PART II SPRING RELEASED BIOLOGY ITEMS

21. Nucleotide sequences from two strands of DNA are shown below.

Old DNA strand: ATG CGC GAT TCG

New DNA strand: ATG CGC AAT TCG

A mutation occurred during replication. What type of mutation is shown?

- *A. point mutation
- B. deletion mutation
- C. inversion mutation
- D. frame shift mutation

22. Which process would be directly affected if all of a cell's ribosomes were weakened?

- A. replicating DNA
- *B. producing new protein
- C. metabolizing glucose to produce ATP
- D. transporting nutrients across the cell membrane

23. Which technology was specifically developed to lessen the effects of human population growth on the environment?

- *A. hybrid cars
- B. medical forensics
- C. stem cell research
- D. digital video and television

24. What could cause a scientific theory to be changed?

- A. data analysis on the most recent investigation
- *B. discovery of flaws in the original data collection
- C. a presentation of current thoughts by leading scientists
- D. a documentary produced and distributed by a scientific organization

25. Which **best** distinguishes between a plant cell and an animal cell?

- A. Plant cells have cell membranes, while animal cells have cell walls.
- B. Plant cells contain centrioles, while animal cells contain chloroplasts.
- *C. Plant cells contain chloroplasts, while animal cells contain centrioles.
- D. Plant cells have small vacuoles, while animal cells have large vacuoles.

PART II SPRING RELEASED BIOLOGY ITEMS

26. Which process cycles carbon through the environment?
- A. transpiration
 - B. sedimentation
 - C. habitat restoration
 - *D. organic decomposition
27. Laboratory instructions require students to assemble a measuring device containing many small parts and springs. Which piece of safety equipment would be required in this investigation?
- A. apron
 - B. gloves
 - C. lab coat
 - *D. safety glasses
28. What is a difference in how primary and secondary succession begin?
- A. Only secondary succession begins on bare rock or new land.
 - B. Only primary succession begins in a previously inhabited area.
 - C. Only secondary succession begins with larger trees and bushes.
 - *D. Only primary succession begins with pioneer organisms such as lichens.
29. Which type of bacteria has a round or spherical shape and can be found in large clumps or long chains?
- *A. coccus
 - B. bacillus
 - C. spirillum
 - D. polyhedral
30. Which **best** illustrates the relationship between variations within a population and natural selection?
- A. Natural selection acts upon a population since all members of the population are identical.
 - B. Organisms are able to change their genetic makeup to best adapt to a changing external environment.
 - C. Giraffes have long necks and legs from stretching to reach food in trees. This trait was then passed to their offspring.
 - *D. Antelopes with muscular legs are able to outrun their predators better than antelopes with poor muscle tone. Thus they lived to reproduce.

PART II SPRING RELEASED BIOLOGY ITEMS

A. The following symbiotic relationships exist within an ecosystem.

- parasitism
- mutualism
- commensalism

1. Define one of these symbiotic relationships.
2. Provide an example of this symbiotic relationship.
3. Define a second type of symbiotic relationship.
4. Provide an example of this symbiotic relationship.

BE SURE TO LABEL YOUR RESPONSES 1, 2, 3, AND 4.

Item A Scoring Rubric—2011 Biology

Part	Points
1	2 points: defines two types of symbiotic relationships
2	2 points: provides an example of each relationship

Score	Description
4	The student earns 4 points. The response shows a <i>complete understanding</i> of symbiosis. The response identifies and defines two forms of symbiosis and provides an example of each form.
3	The student earns 3 points. The response shows a <i>nearly complete understanding</i> of symbiosis. The response correctly addresses three out of the four tasks.
2	The student earns 2 points. The response shows a <i>limited understanding</i> of symbiosis. The response correctly addresses two out of the four tasks.
1	The student earns 1 point. The response shows a <i>minimum understanding</i> of symbiosis. The response correctly addresses one out of the four tasks.
0	The student earns 0 points. The response shows <i>insufficient understanding</i> of symbiosis. The response, if any, contains major errors or may be entirely irrelevant or incoherent.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

PART II SPRING RELEASED BIOLOGY ITEMS

SOLUTION AND SCORING

Symbiotic Relationships

Part	Points	
1 and 3	2 points	<p>Parasitism: the relationship between dissimilar organisms in which one organism benefits while the other organism is harmed</p> <p>Mutualism: the relationship between dissimilar organisms in which both organisms benefit</p> <p>Commensalism: the relationship in which one organism benefits and the other organism is unaffected</p>
2 and 4	2 points	<p>Parasitism Examples: must include parasite and host dog / fleas dog / tick mistletoe / tree tapeworm / cow</p> <p>Common human parasites: Lice Hookworm Giardia Roundworm (Ascaris) Toxoplasma Trichinosis Plasmodium Tapeworm Whipworm Flukes Athlete's foot</p> <p>Mutualism Examples: ants / aphids clown fish / sea anemone green algae / fungus (lichen) butterflies / flowers cattle egret / cape buffalo E. coli / human gut</p> <p>Commensalism Examples: barnacles / whales cattle egret / cape buffalo sponges / sea stars, shrimp or snails orchid / tree clown fish / sea anemone remora / shark</p> <p>and other correct symbiotic relationships</p>

PART II SPRING RELEASED BIOLOGY ITEMS

- B.** Eukaryotic cells contain both DNA and RNA.
1. Identify one location of DNA in an animal cell.
 2. Describe the function of DNA.
 3. Identify one location of RNA in an animal cell.
 4. Describe the function of RNA.

BE SURE TO LABEL YOUR RESPONSES 1, 2, 3, AND 4.

Item B Scoring Rubric—2011 Biology

Part	Points	
1	1 point:	identifies the location of DNA in an animal cell
2	1 point:	describes the function of DNA
3	1 point:	identifies the location of RNA in an animal cell
4	1 point:	describes the function of RNA

Score	Description
4	The student earns 4 points. The response shows a <i>complete understanding</i> of DNA and RNA. The response identifies the location of DNA and RNA in animal cells and explains the function of each.
3	The student earns 3 points. The response shows a <i>nearly complete understanding</i> of DNA and RNA. The response correctly addresses three out of the four tasks.
2	The student earns 2 points. The response shows a <i>limited understanding</i> of DNA and RNA. The response correctly addresses two out of the four tasks.
1	The student earns 1 point. The response shows a <i>minimum understanding</i> of DNA and RNA. The response correctly addresses one out of the four tasks.
0	The student earns 0 points. The response shows <i>insufficient understanding</i> of DNA and RNA. The response, if any, contains major errors or may be entirely irrelevant or incoherent.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

PART II SPRING RELEASED BIOLOGY ITEMS

SOLUTION AND SCORING

Location and Function of DNA and RNA in an Animal Cell

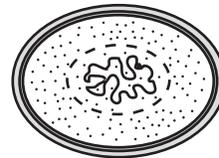
Part	Points	
1	1 point	Locations of DNA <ul style="list-style-type: none">• nucleus• mitochondria• chromosome
2	1 point	Functions of DNA <ul style="list-style-type: none">• store genetic information• transcribe RNA
3	1 point	Locations of RNA <ul style="list-style-type: none">• cytoplasm• ribosome• nucleus• nucleolus• rough endoplasmic reticulum
4	1 point	Functions of RNA <ul style="list-style-type: none">• transfer and transport information essential for protein synthesis• carrier of genetic information• catalyst for biochemical reactions (ribozyme)• adaptor molecule for protein synthesis• structural support molecule (ribosome)

PART II SPRING RELEASED BIOLOGY ITEMS

C. The graphic below shows drawings of what two **different** types of cells may look like.



Eukaryotic Cell



Prokaryotic Cell

1. Describe two structural similarities between a eukaryotic cell and a prokaryotic cell.
2. Other than size or shape, describe two structural differences between a eukaryotic cell and a prokaryotic cell.

In your response, be sure to use appropriate scientific names for cellular structures.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

PART II SPRING RELEASED BIOLOGY ITEMS

Item C Scoring Rubric—2011 Biology

Part	Points
1	2 points: describes two structural similarities between prokaryotic cells and eukaryotic cells
2	2 points: describes two structural differences between prokaryotic cells and eukaryotic cells

Score	Description
4	The student earns 4 points. The response shows a <i>complete understanding</i> of the types of cells. The response explains the structural similarities and differences between the two cell types.
3	The student earns 3 points. The response shows a <i>nearly complete understanding</i> of the types of cells. The response correctly addresses three out of the four tasks.
2	The student earns 2 points. The response shows a <i>limited understanding</i> of the types of cells. The response correctly addresses two out of the four tasks.
1	The student earns 1 point. The response shows a <i>minimum understanding</i> of the types of cells. The response correctly addresses one out of the four tasks.
0	The student earns 0 points. The response shows <i>insufficient understanding</i> of the types of cells. The response, if any, contains major errors or may be entirely irrelevant or incoherent.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

PART II SPRING RELEASED BIOLOGY ITEMS

SOLUTION AND SCORING

Structural Similarities and Differences of Prokaryotic and Eukaryotic Cells

Part	Points
1	<p>2 points total 1 point each</p> <p><u>Structural Similarities</u> Eukaryotic and prokaryotic cells both have: DNA and/or RNA (genetic material) ribosomes cytoplasm (cytosol) cytoskeleton plasma membrane</p>
2	<p>2 points total 1 point each</p> <p><u>Structural Differences</u> Eukaryotic cells have membrane bound organelles and prokaryotic cells do not. (nucleus, mitochondria, Golgi body, chloroplast, lysosome, endoplasmic reticulum, vacuole)</p> <p>The cell wall composition differs between eukaryotes and prokaryotes. Eubacteria – peptidoglycan Archae – proteins, glycoproteins and polysaccharides Plants – cellulose Fungi – chitin Animals – do not have a cell wall</p> <p>Unlike eukaryotic DNA, there are not histone proteins associated with prokaryotic DNA.</p> <p>Prokaryotic DNA is usually circular while eukaryotic DNA is usually linear.</p> <p>The ribosomes of eukaryotic cells are larger and more complex (contain more types of rRNA and proteins) than prokaryotic ribosomes.</p>

PART III CURRICULUM FRAMEWORK

The Arkansas Biology Science Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
1. MOLECULES AND CELLS (MC)	1. Students shall demonstrate an understanding of the role of chemistry in life processes.	<ol style="list-style-type: none"> 1. Describe the structure and function of the major organic molecules found in living systems: <ul style="list-style-type: none"> • carbohydrates • proteins • enzymes • lipids • nucleic acids 2. Describe the relationship between an enzyme and its substrate molecule(s). 3. Investigate the properties and importance of water and its significance for life: <ul style="list-style-type: none"> • surface tension • adhesion • cohesion • polarity • pH 4. Explain the role of energy in chemical reactions of living systems: <ul style="list-style-type: none"> • activation energy • exergonic reactions • endergonic reactions
	2. Students shall demonstrate an understanding of the structure and function of cells.	<ol style="list-style-type: none"> 1. Construct a hierarchy of life from cells to ecosystems. 2. Compare and contrast prokaryotes and eukaryotes. 3. Describe the role of sub-cellular structures in the life of a cell: <ul style="list-style-type: none"> • organelles • ribosomes • cytoskeleton 5. Compare and contrast the structures of an animal cell to a plant cell. 6. Compare and contrast the functions of autotrophs and heterotrophs. 7. Compare and contrast active transport and passive transport mechanisms: <ul style="list-style-type: none"> • diffusion • osmosis • endocytosis • exocytosis • phagocytosis • pinocytosis 8. Describe the main events in the <i>cell cycle</i>, including the differences in plant and animal cell division: <ul style="list-style-type: none"> • <i>interphase</i> • <i>mitosis</i> • <i>cytokinesis</i> 9. List in order and describe the stages of mitosis: <ul style="list-style-type: none"> • prophase • metaphase • anaphase • telophase 10. Analyze the meiotic maintenance of a constant chromosome number from one generation to the next.
	3. Students shall demonstrate an understanding of how cells obtain and use energy (energetics).	<ol style="list-style-type: none"> 1. Compare and contrast the structure and function of mitochondria and chloroplasts. 3. Compare and contrast aerobic and anaerobic respiration: <ul style="list-style-type: none"> • lactic acid fermentation • alcoholic fermentation 5. Compare and contrast cellular respiration and photosynthesis as energy conversion pathways.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the 2011 Mid-Year and Spring End-of-Course Biology Examinations.

PART III CURRICULUM FRAMEWORK

The Arkansas Biology Science Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
2. HEREDITY AND EVOLUTION (HE)	4. Students shall demonstrate an understanding of heredity.	<ol style="list-style-type: none"> 1. Summarize the outcomes of Gregor Mendel's experimental procedures. 3. Use the laws of probability and Punnett squares to predict genotypic and phenotypic ratios. 4. Examine different modes of inheritance: <ul style="list-style-type: none"> • sex linkage • codominance • crossing over • incomplete dominance • multiple alleles 6. Evaluate karyotypes for abnormalities: <ul style="list-style-type: none"> • monosomy • trisomy
	5. Students shall investigate the molecular basis of genetics.	<ol style="list-style-type: none"> 1. Model the components of a DNA nucleotide and an RNA nucleotide. 2. Describe the Watson-Crick double helix model of DNA, using the base-pairing rule (adenine-thymine, cytosine-guanine). 3. Compare and contrast the structure and function of DNA and RNA. 4. Describe and model the processes of replication, transcription, and translation. 5. Compare and contrast the different types of mutation events, including point mutation, frameshift mutation, deletion, and inversion. 6. Identify effects of changes brought about by mutations: <ul style="list-style-type: none"> • beneficial • harmful • neutral
	6. Students shall examine the development of the theory of biological evolution.	<ol style="list-style-type: none"> 1. Compare and contrast Lamarck's explanation of evolution with Darwin's theory of evolution by natural selection. 3. Analyze the effects of mutations and the resulting variations within a population in terms of natural selection. 7. Interpret a Cladogram.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the *2011 Mid-Year* and *Spring End-of-Course Biology Examinations*.

PART III CURRICULUM FRAMEWORK

The Arkansas Biology Science Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
<p>3. CLASSIFICATION AND THE DIVERSITY OF LIFE (CDL)</p>	<p>7. Students shall demonstrate an understanding that organisms are diverse.</p>	<ol style="list-style-type: none"> 1. Differentiate among the different domains: <ul style="list-style-type: none"> • Bacteria • Archaea • Eukarya 2. Differentiate the characteristics of the six kingdoms: <ul style="list-style-type: none"> • Eubacteria • Archaea • Protista • Fungi • Plantae • Animalia 3. Identify the seven major taxonomic categories: <ul style="list-style-type: none"> • kingdom • phylum • class • order • family • genus • species 4. Classify and name organisms based on their similarities and differences applying taxonomic nomenclature using dichotomous keys. 5. Investigate Arkansas' biodiversity using appropriate tools and technology. 6. Compare and contrast the structures and characteristics of viruses (lytic and lysogenic cycles) with non-living and living things. 7. Evaluate the medical and economic importance of viruses. 8. Compare and contrast life cycles of familiar organisms: <ul style="list-style-type: none"> • sexual reproduction • asexual reproduction • metamorphosis • alternation of generations 9. Classify bacteria according to their characteristics and adaptations. 10. Evaluate the medical and economic importance of bacteria. 11. Describe the characteristics used to classify protists: <ul style="list-style-type: none"> • plant-like • animal-like • fungal-like 12. Evaluate the medical and economic importance of protists. 13. Compare and contrast fungi with other eukaryotic organisms. 15. Differentiate between vascular and nonvascular plants. 16. Differentiate among cycads, gymnosperms, and angiosperms. 19. Evaluate the medical and economic importance of plants. 22. Compare and contrast the major vertebrate classes according to their nervous, respiratory, excretory, circulatory, digestive, reproductive and integumentary systems.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the *2011 Mid-Year and Spring End-of-Course Biology Examinations*.

PART III CURRICULUM FRAMEWORK

The Arkansas Biology Science Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
4. ECOLOGY AND BEHAVIORAL RELATIONSHIPS (EBR)	8. Students shall demonstrate an understanding of ecological and behavioral relationships among organisms.	<ol style="list-style-type: none"> 1. Cite examples of abiotic and biotic factors of ecosystems. 2. Compare and contrast the characteristics of biomes. 3. Diagram the carbon, nitrogen, phosphate, and water cycles in an ecosystem. 4. Analyze an ecosystem's energy flow through food chains, food webs, and energy pyramids. 5. Identify and predict the factors that control population, including predation, competition, crowding, water, nutrients, and shelter. 6. Summarize the symbiotic ways in which individuals within a community interact with each other: <ul style="list-style-type: none"> • commensalism • parasitism • mutualism 7. Compare and contrast primary succession with secondary succession. 8. Identify the properties of each of the five levels of ecology: <ul style="list-style-type: none"> • organism • population • community • ecosystem • biosphere
	9. Students shall demonstrate an understanding of the ecological impact of global issues.	<ol style="list-style-type: none"> 1. Analyze the effects of human population growth and technology on the environment/biosphere.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the *2011 Mid-Year* and *Spring End-of-Course Biology Examinations*.

PART III CURRICULUM FRAMEWORK

The Arkansas Biology Science Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
5. NATURE OF SCIENCE (NS)	10. Students shall demonstrate an understanding that science is a way of knowing.	2. Compare and contrast hypotheses, theories, and laws. 4. Summarize the guidelines of science: <ul style="list-style-type: none"> • explanations are based on observations, evidence, and testing • hypotheses must be testable • understandings and/or conclusions may change with additional empirical data • scientific knowledge must have peer review and verification before acceptance
	11. Students shall design and safely conduct a scientific inquiry.	1. Develop and explain the appropriate procedure, controls, and variables (dependent and independent) in scientific experimentation. 2. Research and apply appropriate safety precautions (refer to ADE Guidelines) when designing and/or conducting scientific investigations. 4. Gather and analyze data using appropriate summary statistics. 5. Formulate valid conclusions without bias. 6. Communicate experimental results using appropriate reports, figures, and tables.
	12. Students shall demonstrate an understanding of current life science theories.	2. Understand that scientific theories may be modified or expanded based on additional empirical data, verification, and peer review. 3. Summarize biological evolution. 4. Relate the development of the cell theory to current trends in cellular biology. 5. Describe the relationship between the germ theory of disease and our current knowledge of immunology and control of infectious diseases. 6. Relate the chromosome theory of heredity to recent findings in genetic research (e.g., Human Genome Project–HGP, chromosome therapy). 7. Research current events and topics in biology.
	13. Students shall use mathematics, science equipment, and technology as tools to communicate and solve life science problems.	1. Collect and analyze scientific data using appropriate mathematical calculations, figures, and tables. 2. Use appropriate equipment and technology as tools for solving problems (e.g., microscopes, centrifuges, flexible arm cameras, computer software and hardware).
	14. Students shall describe the connections between pure and applied science.	1. Compare and contrast biological concepts in pure science and applied science. 4. Explain how the cyclical relationship between science and technology results in reciprocal advancements in science and technology.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the *2011 Mid-Year and Spring End-of-Course Biology Examinations*.

PART IV ITEM CORRELATION WITH CURRICULUM FRAMEWORK

Mid-Year Released Biology Items*

Strands	Content Standards
1— MOLECULES AND CELLS (MC)	1. Students shall demonstrate an understanding of the role of chemistry in life processes. 2. Students shall demonstrate an understanding of the structure and function of cells. 3. Students shall demonstrate an understanding of how cells obtain and use energy (energetics).
2— HEREDITY AND EVOLUTION (HE)	4. Students shall demonstrate an understanding of heredity. 5. Students shall investigate the molecular basis of genetics.
3— CLASSIFICATION AND THE DIVERSITY OF LIFE (CDL)	7. Students shall demonstrate an understanding that organisms are diverse.
4— ECOLOGY AND BEHAVIORAL RELATIONSHIPS (EBR)	8. Students shall demonstrate an understanding of ecological and behavioral relationships among organisms.
5— NATURE OF SCIENCE (NS)	10. Students shall demonstrate an understanding that science is a way of knowing. 11. Students shall design and safely conduct a scientific inquiry. 12. Students shall demonstrate an understanding of current life science theories.

Item	Strand	Content Standard	Student Learning Expectation
1	MC	1	1
2	EBR	8	8
3	NS	12	5
4	MC	2	9
5	HE	4	3
6	CDL	7	1
7	EBR	8	6
8	NS	11	2
9	HE	4	4
10	CDL	7	9
11	EBR	8	1
12	MC	2	5
13	CDL	7	15
14	HE	5	1
15	CDL	7	16
16	HE	5	2
17	CDL	7	6
18	MC	3	1
19	HE	5	3
20	NS	12	6
21	MC	2	7
22	HE	5	4
23	NS	10	2
24	MC	2	2
25	NS	12	2
26	EBR	8	3
27	CDL	7	13
28	EBR	8	8
29	EBR	8	1
30	NS	11	1
A	NS	11	1
B	CDL	7	10

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Biology items.

PART IV ITEM CORRELATION WITH CURRICULUM FRAMEWORK

Spring Released Biology Items*

Strands	Content Standards
1— MOLECULES AND CELLS (MC)	1. Students shall demonstrate an understanding of the role of chemistry in life processes. 2. Students shall demonstrate an understanding of the structure and function of cells.
2— HEREDITY AND EVOLUTION (HE)	4. Students shall demonstrate an understanding of heredity. 5. Students shall investigate the molecular basis of genetics. 6. Students shall examine the development of the theory of biological evolution.
3— CLASSIFICATION AND THE DIVERSITY OF LIFE (CDL)	7. Students shall demonstrate an understanding that organisms are diverse.
4— ECOLOGY AND BEHAVIORAL RELATIONSHIPS (EBR)	8. Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. 9. Students shall demonstrate an understanding of the ecological impact of global issues.
5— NATURE OF SCIENCE (NS)	11. Students shall design and safely conduct a scientific inquiry. 12. Students shall demonstrate an understanding of current life science theories. 14. Students shall describe the connections between pure and applied science.

Item	Strand	Content Standard	Student Learning Expectation
1	NS	11	2
2	CDL	7	12
3	HE	4	4
4	MC	2	1
5	EBR	8	3
6	CDL	7	22
7	HE	5	1
8	NS	14	1
9	MC	2	10
10	NS	12	3
11	CDL	7	13
12	HE	4	1
13	EBR	8	2
14	MC	1	2
15	EBR	8	1
16	NS	11	5
17	CDL	7	5
18	HE	5	3
19	MC	1	4
20	CDL	7	6
21	HE	5	5
22	MC	2	3
23	EBR	9	1
24	NS	12	2
25	MC	2	5
26	EBR	8	3
27	NS	11	2
28	EBR	8	7
29	CDL	7	9
30	HE	6	3
A	EBR	8	6
B	HE	5	3
C	MC	2	2

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Biology items.

PART IV ITEM CORRELATION WITH CURRICULUM FRAMEWORK

Mid-Year Non-Released Biology Items*

Strands	Content Standards
1— MOLECULES AND CELLS (MC)	1. Students shall demonstrate an understanding of the role of chemistry in life processes. 2. Students shall demonstrate an understanding of the structure and function of cells. 3. Students shall demonstrate an understanding of how cells obtain and use energy (energetics).
2— HEREDITY AND EVOLUTION (HE)	4. Students shall demonstrate an understanding of heredity. 5. Students shall investigate the molecular basis of genetics. 6. Students shall examine the development of the theory of biological evolution.
3— CLASSIFICATION AND THE DIVERSITY OF LIFE (CDL)	7. Students shall demonstrate an understanding that organisms are diverse.
4— ECOLOGY AND BEHAVIORAL RELATIONSHIPS (EBR)	8. Students shall demonstrate an understanding of ecological and behavioral relationships among organisms.
5— NATURE OF SCIENCE (NS)	11. Students shall design and safely conduct a scientific inquiry. 12. Students shall demonstrate an understanding of current life science theories. 13. Students shall use mathematics, science equipment, and technology as tools to communicate and solve life science problems. 14. Students shall describe the connections between pure and applied science.

Item	Strand	Content Standard	Student Learning Expectation
1	HE	4	1
2	CDL	7	2
3	MC	3	3
4	NS	12	7
5	HE	4	6
6	EBR	8	2
7	NS	13	1
8	MC	2	1
9	EBR	8	7
10	NS	11	5
11	MC	1	2
12	EBR	8	5
13	NS	12	3
14	CDL	7	8
15	EBR	8	4
16	CDL	7	3
17	EBR	8	7
18	HE	5	5
19	CDL	7	4
20	EBR	8	6
21	MC	3	5
22	HE	5	6
23	CDL	7	10
24	NS	14	4
25	MC	2	8
26	HE	6	3
27	NS	12	4
28	MC	2	10
29	HE	6	7
30	CDL	7	11
A	MC	2	2
B	HE	5	3
C	EBR	8	2

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Biology items.

PART IV ITEM CORRELATION WITH CURRICULUM FRAMEWORK

Spring Non-Released Biology Items*

Strands	Content Standards
1— MOLECULES AND CELLS (MC)	1. Students shall demonstrate an understanding of the role of chemistry in life processes. 2. Students shall demonstrate an understanding of the structure and function of cells. 3. Students shall demonstrate an understanding of how cells obtain and use energy (energetics).
2— HEREDITY AND EVOLUTION (HE)	4. Students shall demonstrate an understanding of heredity. 5. Students shall investigate the molecular basis of genetics. 6. Students shall examine the development of the theory of biological evolution.
3— CLASSIFICATION AND THE DIVERSITY OF LIFE (CDL)	7. Students shall demonstrate an understanding that organisms are diverse.
4— ECOLOGY AND BEHAVIORAL RELATIONSHIPS (EBR)	8. Students shall demonstrate an understanding of ecological and behavioral relationships among organisms.
5— NATURE OF SCIENCE (NS)	10. Students shall demonstrate an understanding that science is a way of knowing. 11. Students shall design and safely conduct a scientific inquiry. 12. Students shall demonstrate an understanding of current life science theories. 13. Students shall use mathematics, science equipment, and technology as tools to communicate and solve life science problems.

Item	Strand	Content Standard	Student Learning Expectation
1	MC	2	5
2	EBR	8	8
3	NS	12	3
4	HE	5	2
5	NS	11	1
6	MC	3	3
7	EBR	8	7
8	CDL	7	10
9	EBR	8	6
10	CDL	7	1
11	HE	5	4
12	MC	2	2
13	EBR	8	2
14	NS	10	4
15	MC	3	1
16	CDL	7	3
17	HE	4	3
18	NS	11	4
19	CDL	7	4
20	HE	4	6
21	MC	1	3
22	EBR	8	4
23	NS	13	2
24	EBR	8	5
25	NS	11	6
26	CDL	7	7
27	HE	5	6
28	CDL	7	8
29	HE	6	1
30	MC	2	6
A	CDL	7	19
B	NS	13	1

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Biology items.

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