| Subject | Chapter 112. Science | | | |
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| **Course Title** | **§112.34. Biology, Beginning with School Year 2010-2011 (One Credit).** | | | |
| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| **(a) General requirements.** | | | | |
| Students shall be awarded one credit for successful completion of this course. Prerequisites: none. This course is recommended for students in Grade 9, 10, or 11. | | | | |
| **(b) Introduction.** | | | | |
| (1) Biology. In Biology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; and ecosystems and the environment. | | | | |
| (2) Nature of science. Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable. | | | | |
| (3) Scientific inquiry. Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation are experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked. | | | | |
| (4) Science and social ethics. Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods (scientific methods) and ethical and social decisions that involve science (the application of scientific information). | | | | |
| (5) Science, systems, and models. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment. | | | | |
| **(c) Knowledge and skills.** | | | | |
| (1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to: | (A) demonstrate safe practices during laboratory and field investigations | (i) demonstrate safe practices during laboratory investigations | | |
| (1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to: | (A) demonstrate safe practices during laboratory and field investigations | (ii) demonstrate safe practices during field investigations | | |

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| (1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to: | (B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials | (i) demonstrate an understanding of the use of resources | | |
| (1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to: | (B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials | (ii) demonstrate an understanding of the conservation of resources | | |
| (1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to: | (B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials | (iii) demonstrate an understanding of the proper disposal or recycling of materials | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section | (i) know the definition of science, as specified in subsection (b)(2) [above] | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section | (ii) understand that [science] has limitations, as specified in subsection (b)(2) [above] | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories | (i) know that hypotheses are tentative statements that must be capable of being supported or not supported by observational evidence | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories | (ii) know that hypotheses are testable statements that must be capable of being supported or not supported by observational evidence | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories | (iii) [know that] hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed | (i) know [that] scientific theories are based on natural and physical phenomena | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed | (ii) know [that] scientific theories are capable of being tested by multiple independent researchers | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed | (iii) [know that] unlike hypotheses, scientific theories are well-established explanations | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed | (iv) [know that], unlike hypotheses, scientific theories are highly-reliable explanations | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed | (v) [know that] scientific theories may be subject to change as new areas of science are developed | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed | (vi) [know that] scientific theories may be subject to change as new technologies are developed | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (D) distinguish between scientific hypotheses and scientific theories | | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (i) plan descriptive investigations, including asking questions | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (ii) plan descriptive investigations, including formulating testable hypotheses | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (iii) plan descriptive investigations, including selecting equipment | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (iv) plan descriptive investigations, including selecting technology | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (v) implement descriptive investigations, including asking questions | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (vi) implement descriptive investigations, including formulating testable hypotheses | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (vii) implement descriptive investigations, including selecting equipment | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (viii) implement descriptive investigations, including selecting technology | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (ix) plan comparative investigations, including asking questions | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (x) plan comparative investigations, including formulating testable hypotheses | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xi) plan comparative investigations, including selecting equipment | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xii) plan comparative investigations, including selecting technology | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xiii) implement comparative investigations, including asking questions | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xiv) implement comparative investigations, including formulating testable hypotheses | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xv) implement comparative investigations, including selecting equipment | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xvi) implement comparative investigations, including selecting technology | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xvii) plan experimental investigations, including asking questions | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xviii) plan experimental investigations, including formulating testable hypotheses | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xix) plan experimental investigations, including selecting equipment | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xx) plan experimental investigations, including selecting technology | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xxi) implement experimental investigations, including asking questions | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xxii) implement experimental investigations, including formulating testable hypotheses | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xxiii) implement experimental investigations, including selecting equipment | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology | (xxiv) implement experimental investigations, including selecting technology | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures | (i) collect qualitative data using [various] tools | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures | (ii) organize qualitative data using [various] tools | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures | (iii) collect quantitative data using [various] tools | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures | (iv) organize quantitative data using [various] tools | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures | (vi) make measurements with precision using [various] tools | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (G) analyze, evaluate, make inferences, and predict trends from data | (i) analyze data | | |

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| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (G) analyze, evaluate, make inferences, and predict trends from data | (ii) evaluate data | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (G) analyze, evaluate, make inferences, and predict trends from data | (iii) make inferences from data | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (G) analyze, evaluate, make inferences, and predict trends from data | (iv) predict trends from data | | |
| (2) Scientific processes. The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to: | (H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports | (i) communicate valid conclusions supported by the data through [various] methods | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (i) in all fields of science, analyze scientific explanations by using empirical evidence | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (ii) in all fields of science, analyze scientific explanations by using logical reasoning | | |

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| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (iv) in all fields of science, analyze scientific explanations by using observational testing | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (v) in all fields of science, analyze scientific explanations, including examining all sides of scientific evidence of those scientific explanations | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (vi) in all fields of science, evaluate scientific explanations by using empirical evidence | | |

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| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (viii) in all fields of science, evaluate scientific explanations by using experimental testing | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (ix) in all fields of science, evaluate scientific explanations by using observational testing | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (x) in all fields of science, evaluate scientific explanations, including examining all sides of scientific evidence of those scientific explanations | | |

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| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (xi) in all fields of science, critique scientific explanations by using empirical evidence | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (xii) in all fields of science, critique scientific explanations by using logical reasoning | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (xiii) in all fields of science, critique scientific explanations by using experimental testing | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (xiv) in all fields of science, critique scientific explanations by using observational testing | | |

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| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | (xv) in all fields of science, critique scientific explanations, including examining all sides of scientific evidence of those scientific explanations | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials | (i) communicate scientific information extracted from various sources | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials | (ii) apply scientific information extracted from various sources | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (C) draw inferences based on data related to promotional materials for products and services | (i) draw inferences based on data related to promotional materials for products | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (C) draw inferences based on data related to promotional materials for products and services | (ii) draw inferences based on data related to promotional materials for services | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (D) evaluate the impact of scientific research on society and the environment | (i) evaluate the impact of scientific research on society | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (D) evaluate the impact of scientific research on society and the environment | (ii) evaluate the impact of scientific research on the environment | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (E) evaluate models according to their limitations in representing biological objects or events | | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (F) research and describe the history of biology and contributions of scientists | (i) research the history of biology | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (F) research and describe the history of biology and contributions of scientists | (ii) research contributions of scientists | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (F) research and describe the history of biology and contributions of scientists | (iii) describe the history of biology | | |
| (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to: | (F) research and describe the history of biology and contributions of scientists | (iv) describe the contributions of scientists | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (A) compare and contrast prokaryotic and eukaryotic cells | (i) compare prokaryotic and eukaryotic cells | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (A) compare and contrast prokaryotic and eukaryotic cells | (ii) contrast prokaryotic and eukaryotic cells | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (i) investigate cellular processes, including homeostasis | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (ii) investigate cellular processes, including energy conversions | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (iii) investigate cellular processes, including transport of molecules | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (iv) investigate cellular processes, including synthesis of new molecules | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (v) explain cellular processes, including homeostasis | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (vi) explain cellular processes, including energy conversions | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (vii) explain cellular processes, including transport of molecules | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules | (viii) explain cellular processes, including synthesis of new molecules | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (C) compare the structures of viruses to cells, describe viral reproduction, and describe the role of viruses in causing diseases such as human immunodeficiency virus (HIV) and influenza | (i) compare the structures of viruses to cells | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (C) compare the structures of viruses to cells, describe viral reproduction, and describe the role of viruses in causing diseases such as human immunodeficiency virus (HIV) and influenza | (ii) describe viral reproduction | | |
| (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to: | (C) compare the structures of viruses to cells, describe viral reproduction, and describe the role of viruses in causing diseases such as human immunodeficiency virus (HIV) and influenza | (iii) describe the role of viruses in causing diseases | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (A) describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms | (i) describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (A) describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms | (ii) describe the stages of the cell cycle, including mitosis | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (A) describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms | (iii) describe the importance of the cell cycle to the growth of organisms | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (B) examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium | (i) examine specialized cells, including roots of plants | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (B) examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium | (ii) examine specialized cells, including stems of plants | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (B) examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium | (iii) examine specialized cells, including leaves of plants | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (B) examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium | (iv) examine specialized cells, including animal cells | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (C) describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation | (i) describe the role of DNA in cell differentiation | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (C) describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation | (ii) describe the role of ribonucleic acid (RNA) in cell differentiation | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (C) describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation | (iii) describe the role of environmental factors in cell differentiation | | |
| (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: | (D) recognize that disruptions of the cell cycle lead to diseases such as cancer | (i) recognize that disruptions of the cell cycle lead to diseases | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (A) identify components of DNA, and describe how information for specifying the traits of an organism is carried in the DNA | (i) identify components of DNA | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (A) identify components of DNA, and describe how information for specifying the traits of an organism is carried in the DNA | (ii) describe how information for specifying the traits of an organism is carried in the DNA | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (B) recognize that components that make up the genetic code are common to all organisms | | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (C) explain the purpose and process of transcription and translation using models of DNA and RNA | (i) explain the purpose of transcription using models of DNA and RNA | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (C) explain the purpose and process of transcription and translation using models of DNA and RNA | (ii) explain the process of transcription using models of DNA and RNA | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (C) explain the purpose and process of transcription and translation using models of DNA and RNA | (iii) explain the purpose of translation using models of RNA | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (C) explain the purpose and process of transcription and translation using models of DNA and RNA | (iv) explain the process of translation using models of RNA | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (D) recognize that gene expression is a regulated process | | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (E) identify and illustrate changes in DNA and evaluate the significance of these changes | (i) identify changes in DNA | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (E) identify and illustrate changes in DNA and evaluate the significance of these changes | (ii) illustrate changes in DNA | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (E) identify and illustrate changes in DNA and evaluate the significance of these changes | (iii) evaluate the significance of changes [in DNA] | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (F) predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses and non-Mendelian inheritance | (i) predict possible outcomes of various genetic combinations | | |
| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (G) recognize the significance of meiosis to sexual reproduction | | | |

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| (6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to: | (H) describe how techniques such as DNA fingerprinting, genetic modifications, and chromosomal analysis are used to study the genomes of organisms | (i) describe how [various] techniques are used to study the genomes of organisms | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (i) analyze how evidence of common ancestry among groups is provided by the fossil record | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (ii) analyze how evidence of common ancestry among groups is provided by biogeography | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (iii) analyze how evidence of common ancestry among groups is provided by homologies, including anatomical | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (iv) analyze how evidence of common ancestry among groups is provided by homologies, including molecular | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (v) analyze how evidence of common ancestry among groups is provided by homologies, including developmental | | |

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| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (vi) evaluate how evidence of common ancestry among groups is provided by the fossil record | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (vii) evaluate how evidence of common ancestry among groups is provided by biogeography | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (viii) evaluate how evidence of common ancestry among groups is provided by homologies, including anatomical | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (ix) evaluate how evidence of common ancestry among groups is provided by homologies, including molecular | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental | (x) evaluate how evidence of common ancestry among groups is provided by homologies, including developmental | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (B) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record | (i) analyze scientific explanations concerning any data of sudden appearance in the fossil record | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (B) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record | (ii) analyze scientific explanations concerning any data of stasis in the fossil record | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (B) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record | (iii) analyze scientific explanations concerning any data of sequential nature of groups in the fossil record | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (B) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record | (iv) evaluate scientific explanations concerning any data of sudden appearance in the fossil record | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (B) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record | (v) evaluate scientific explanations concerning any data of stasis in the fossil record | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (B) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record | (vi) evaluate scientific explanations concerning any data of sequential nature of groups in the fossil record | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (C) analyze and evaluate how natural selection produces change in populations, not individuals | (i) analyze how natural selection produces change in populations, not individuals | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (C) analyze and evaluate how natural selection produces change in populations, not individuals | (ii) evaluate how natural selection produces change in populations, not individuals | | |

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| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (D) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success | (i) analyze how the elements of natural selection, including inherited variation, result in differential reproductive success | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (D) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success | (ii) analyze how the elements of natural selection, including the potential of a population to produce more offspring than can survive, result in differential reproductive success | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (D) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success | (iii) analyze how the elements of natural selection, including a finite supply of environmental resources, result in differential reproductive success | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (D) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success | (iv) evaluate how the elements of natural selection, including inherited variation, result in differential reproductive success | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (D) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success | (v) evaluate how the elements of natural selection, including the potential of a population to produce more offspring than can survive, result in differential reproductive success | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (D) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success | (vi) evaluate how the elements of natural selection, including a finite supply of environmental resources, result in differential reproductive success | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species | (i) analyze the relationship of natural selection to adaptation | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species | (ii) analyze the relationship of natural selection to the development of diversity in species | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species | (iii) analyze the relationship of natural selection to the development of diversity among species | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species | (iv) evaluate the relationship of natural selection to adaptation | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species | (v) evaluate the relationship of natural selection to the development of diversity in species | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species | (vi) evaluate the relationship of natural selection to the development of diversity among species | | |

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| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (i) analyze the effects of other evolutionary mechanisms, including genetic drift | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (ii) analyze the effects of other evolutionary mechanisms, including gene flow | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (iii) analyze the effects of other evolutionary mechanisms, including mutation | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (iv) analyze the effects of other evolutionary mechanisms, including recombination | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (v) evaluate the effects of other evolutionary mechanisms, including genetic drift | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (vi) evaluate the effects of other evolutionary mechanisms, including gene flow | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (vii) evaluate the effects of other evolutionary mechanisms, including mutation | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination | (viii) evaluate the effects of other evolutionary mechanisms, including recombination | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (G) analyze and evaluate scientific explanations concerning the complexity of the cell | (i) analyze scientific explanations concerning the complexity of the cell | | |
| (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to: | (G) analyze and evaluate scientific explanations concerning the complexity of the cell | (ii) evaluate scientific explanations concerning the complexity of the cell | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (A) define taxonomy and recognize the importance of a standardized taxonomic system to the scientific community | (i) define taxonomy | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (A) define taxonomy and recognize the importance of a standardized taxonomic system to the scientific community | (ii) recognize the importance of a standardized taxonomic system to the scientific community | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (B) categorize organisms using a hierarchical classification system based on similarities and differences shared among groups | (i) categorize organisms using a hierarchical classification system based on similarities shared among groups | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (B) categorize organisms using a hierarchical classification system based on similarities and differences shared among groups | (ii) categorize organisms using a hierarchical classification system based on differences among groups | | |

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| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals | (i) compare characteristics of taxonomic groups, including archaea | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals | (ii) compare characteristics of taxonomic groups, including bacteria | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals | (iii) compare characteristics of taxonomic groups, including protists | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals | (iv) compare characteristics of taxonomic groups, including fungi | | |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals | (v) compare characteristics of taxonomic groups, including plants | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to: | (C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals | (vi) compare characteristics of taxonomic groups, including animals | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (i) compare the structures of different types of biomolecules, including carbohydrates | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (ii) compare the structures of different types of biomolecules, including lipids | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (iii) compare the structures of different types of biomolecules, including proteins | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (iv) compare the structures of different types of biomolecules, including nucleic acids | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (v) compare the functions of different types of biomolecules, including carbohydrates | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (vi) compare the functions of different types of biomolecules, including lipids | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (vii) compare the functions of different types of biomolecules, including proteins | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids | (viii) compare the functions of different types of biomolecules, including nucleic acids | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter | (i) compare the reactants and products of photosynthesis in terms of energy | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter | (ii) compare the reactants and products of photosynthesis in terms of matter | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter | (iii) compare the reactants and products of cellular respiration in terms of energy | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter | (iv) compare the reactants and products of cellular respiration in terms of matter | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (C) identify and investigate the role of enzymes | (i) identify the role of enzymes | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (C) identify and investigate the role of enzymes | (ii) investigate the role of enzymes | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (D) analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life | (i) analyze the evidence regarding formation of simple organic molecules | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (D) analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life | (ii) analyze the evidence regarding organization [of simple organic molecules] into long complex molecules having information | | |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (D) analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life | (iii) evaluate the evidence regarding formation of simple organic molecules | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to: | (D) analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life | (iv) evaluate the evidence regarding organization [of simple organic molecules] into long complex molecules having information | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (A) describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals | (i) describe the interactions that occur among systems that perform the function of regulation in animals | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (A) describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals | (ii) describe the interactions that occur among systems that perform the function of nutrient absorption in animals | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (A) describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals | (iii) describe the interactions that occur among systems that perform the function of reproduction in animals | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (A) describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals | (iv) describe the interactions that occur among systems that perform the function of defense from injury or illness in animals | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (B) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants | (i) describe the interactions that occur among systems that perform the function of transport in plants | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (B) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants | (ii) describe the interactions that occur among systems that perform the function of reproduction in plants | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (B) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants | (iii) describe the interactions that occur among systems that perform the function of response in plants | | |

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| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system | (i) analyze the levels of organization in biological systems | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system | (ii) relate the levels [of organization in biological systems] to each other | | |
| (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to: | (C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system | (iii) relate the levels [of organization in biological systems] to the whole system | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (A) describe the role of internal feedback mechanisms in the maintenance of homeostasis | | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (B) investigate and analyze how organisms, populations, and communities respond to external factors | (i) investigate how organisms respond to external factors | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (B) investigate and analyze how organisms, populations, and communities respond to external factors | (ii) investigate how populations respond to external factors | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (B) investigate and analyze how organisms, populations, and communities respond to external factors | (iii) investigate how communities respond to external factors | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (B) investigate and analyze how organisms, populations, and communities respond to external factors | (iv) analyze how organisms respond to external factors | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (B) investigate and analyze how organisms, populations, and communities respond to external factors | (v) analyze how populations respond to external factors | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (B) investigate and analyze how organisms, populations, and communities respond to external factors | (vi) analyze how communities respond to external factors | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (C) summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems | (i) summarize the role of microorganisms in maintaining the health of organisms | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (C) summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems | (ii) summarize the role of microorganisms in maintaining the health of ecosystems | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (C) summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems | (iii) summarize the role of microorganisms in disrupting the health of organisms | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (C) summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems | (iv) summarize the role of microorganisms in disrupting the health of ecosystems | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (D) describe how events and processes that occur during ecological succession can change populations and species diversity | (i) describe how events that occur during ecological succession can change populations | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (D) describe how events and processes that occur during ecological succession can change populations and species diversity | (ii) describe how events that occur during ecological succession can change species diversity | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (D) describe how events and processes that occur during ecological succession can change populations and species diversity | (iii) describe how processes that occur during ecological succession can change populations | | |
| (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: | (D) describe how events and processes that occur during ecological succession can change populations and species diversity | (iv) describe how processes that occur during ecological succession can change species diversity | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms | (i) interpret relationships, including predation, among organisms | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms | (ii) interpret relationships, including parasitism, among organisms | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms | (iii) interpret relationships, including commensalism, among organisms | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms | (iv) interpret relationships, including mutualism, among organisms | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms | (v) interpret relationships, including competition, among organisms | | |

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| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (B) compare variations and adaptations of organisms in different ecosystems | (i) compare variations of organisms in different ecosystems | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (B) compare variations and adaptations of organisms in different ecosystems | (ii) compare adaptations of organisms in different ecosystems | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids | (i) analyze the flow of matter through trophic levels using various models, including food chains | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids | (ii) analyze the flow of matter through trophic levels using various models, including food webs | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids | (iii) analyze the flow of matter through trophic levels using various models, including ecological pyramids | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids | (iv) analyze the flow of energy through trophic levels using various models, including food chains | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids | (v) analyze the flow of energy through trophic levels using various models, including food webs | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids | (vi) analyze the flow of energy through trophic levels using various models, including ecological pyramids | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (D) recognize that long-term survival of species is dependent on changing resource bases that are limited | | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (E) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles | (i) describe the flow of matter through the carbon cycle | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (E) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles | (ii) describe the flow of matter through the nitrogen cycle | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (E) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles | (iii) explain the consequences of disrupting [the carbon cycle] | | |

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| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (E) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles | (iv) explain the consequences of disrupting [the nitrogen cycle] | | |
| (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to: | (F) describe how environmental change can impact ecosystem stability | | | |