| Subject | Chapter 112. Science | | | |
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| Course Title | §112.36. Earth and Space Science, 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. Required prerequisites: three units of science, one of which may be taken concurrently, and three units of mathematics, one of which may be taken concurrently. This course is recommended for students in Grade 12 but may be taken by students in Grade 11.

**(b) Introduction.**

(1) Earth and Space Science (ESS). ESS is a capstone course designed to build on students' prior scientific and academic knowledge and skills to develop understanding of Earth's system in space and time.

(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 can be 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 and ethical and social decisions that involve the application of scientific information.

(5) ESS themes. An Earth systems approach to the themes of Earth in space and time, solid Earth, and fluid Earth defined the selection and development of the concepts described in this paragraph.
(A) Earth in space and time. Earth has a long, complex, and dynamic history. Advances in technologies continue to further our understanding of the origin, evolution, and properties of Earth and planetary systems within a chronological framework. The origin and distribution of resources that sustain life on Earth are the result of interactions among Earth's subsystems over billions of years.
(B) Solid Earth. The geosphere is a collection of complex, interacting, dynamic subsystems linking Earth's interior to its surface. The geosphere is composed of materials that move between subsystems at various rates driven by the uneven distribution of thermal energy. These dynamic processes are responsible for the origin and distribution of resources as well as geologic hazards that impact society.
(C) Fluid Earth. The fluid Earth consists of the hydrosphere, cryosphere, and atmosphere subsystems. These subsystems interact with the biosphere and geosphere resulting in complex biogeochemical and geochemical cycles. The global ocean is the thermal energy reservoir for surface processes and, through interactions with the atmosphere, influences climate. Understanding these interactions and cycles over time has implications for life on Earth.

(6) Earth and space science strands. ESS has three strands used throughout each of the three themes: systems, energy, and relevance.
(A) Systems. A system is a collection of interacting physical, chemical, and biological processes that involves the flow of matter and energy on different temporal and spatial scales. Earth's system is composed of interdependent and interacting subsystems of the geosphere, hydrosphere, atmosphere, cryosphere, and biosphere within a larger planetary and stellar system. Change and constancy occur in Earth's system and can be observed, measured as patterns and cycles, and described or presented in models used to predict how Earth's system changes over time.
(B) Energy. The uneven distribution of Earth's internal and external thermal energy is the driving force for complex, dynamic, and continuous interactions and cycles in Earth's subsystems. These interactions are responsible for the movement of matter within and between the subsystems resulting in, for example, plate motions and ocean-atmosphere circulation.
(C) Relevance. The interacting components of Earth's system change by both natural and human-influenced processes. Natural processes include hazards such as flooding, earthquakes, volcanoes, hurricanes, meteorite impacts, and climate change. Some human-influenced processes such as pollution and nonsustainable use of Earth's natural resources may damage Earth's system. Examples include climate change, soil erosion, air and water pollution, and biodiversity loss. The time scale of these changes and their impact on human society must be understood to make wise decisions concerning the use of the land, water, air, and natural resources. Proper stewardship of Earth will prevent unnecessary degradation and destruction of Earth's subsystems and diminish detrimental impacts to individuals and society.

| **(C) Knowledge and skills.** | | | | |
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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (1) Scientific processes. The student conducts laboratory and field investigations, for at least 40% of instructional time, 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 conducts laboratory and field investigations, for at least 40% of instructional time, 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 | | |
| (1) Scientific processes. The student conducts laboratory and field investigations, for at least 40% of instructional time, 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 conducts laboratory and field investigations, for at least 40% of instructional time, 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 conducts laboratory and field investigations, for at least 40% of instructional time, 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 the proper disposal or recycling of materials | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (1) Scientific processes. The student conducts laboratory and field investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. The student is expected to: | (C) use the school's technology and information systems in a wise and ethical manner | (i) use the school's technology systems in a wise manner | | |
| (1) Scientific processes. The student conducts laboratory and field investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. The student is expected to: | (C) use the school's technology and information systems in a wise and ethical manner | (ii) use the school's information systems in a wise manner | | |
| (1) Scientific processes. The student conducts laboratory and field investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. The student is expected to: | (C) use the school's technology and information systems in a wise and ethical manner | (iii) use the school's technology systems in a[n] ethical manner | | |
| (1) Scientific processes. The student conducts laboratory and field investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. The student is expected to: | (C) use the school's technology and information systems in a wise and ethical manner | (iv) use the school's information systems in a[n] ethical manner | | |
| (2) Scientific processes. The student uses scientific methods 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 | | |
| (2) Scientific processes. The student uses scientific methods 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] | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (B) know that scientific 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 scientific hypotheses are tentative statements that must be capable of being supported or not supported by observational evidence | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (B) know that scientific 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 scientific 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 during laboratory and field investigations. The student is expected to: | (B) know that scientific 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 | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (C) know that 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 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 during laboratory and field investigations. The student is expected to: | (C) know that 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 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 | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (C) know that 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 may be subject to change as new areas of science and new technologies are developed | (iv) [know that], unlike hypotheses, scientific theories are well-established explanations | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (C) know that 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 may be subject to change as new areas of science and new technologies are developed | (v) [know that], unlike hypotheses, scientific theories are highly-reliable explanations | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (C) know that 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 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 areas of science are developed | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (C) know that 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 may be subject to change as new areas of science and new technologies are developed | (vii) [know that scientific theories] may be subject to change as new technologies are developed | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (D) distinguish between scientific hypotheses and scientific theories | | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (E) demonstrate the use of course equipment, techniques, and procedures, including computers and web-based computer applications | (i) demonstrate the use of course equipment, including computers | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (E) demonstrate the use of course equipment, techniques, and procedures, including computers and web-based computer applications | (ii) demonstrate the use of course techniques, including web-based computer applications | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (E) demonstrate the use of course equipment, techniques, and procedures, including computers and web-based computer applications | (iii) demonstrate the use of course procedures | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (F) use a wide variety of additional course apparatuses, equipment, techniques, and procedures as appropriate such as satellite imagery and other remote sensing data, Geographic Information Systems (GIS), Global Positioning System (GPS), scientific probes, microscopes, telescopes, modern video and image libraries, weather stations, fossil and rock kits, bar magnets, coiled springs, wave simulators, tectonic plate models, and planetary globes | (i) use a wide variety of additional course apparatuses [and] equipment as appropriate | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (F) use a wide variety of additional course apparatuses, equipment, techniques, and procedures as appropriate such as satellite imagery and other remote sensing data, Geographic Information Systems (GIS), Global Positioning System (GPS), scientific probes, microscopes, telescopes, modern video and image libraries, weather stations, fossil and rock kits, bar magnets, coiled springs, wave simulators, tectonic plate models, and planetary globes | (ii) use a wide variety of additional techniques as appropriate | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (F) use a wide variety of additional course apparatuses, equipment, techniques, and procedures as appropriate such as satellite imagery and other remote sensing data, Geographic Information Systems (GIS), Global Positioning System (GPS), scientific probes, microscopes, telescopes, modern video and image libraries, weather stations, fossil and rock kits, bar magnets, coiled springs, wave simulators, tectonic plate models, and planetary globes | (iii) use a wide variety of additional course procedures as appropriate | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (G) organize, analyze, evaluate, make inferences, and predict trends from data | (i) organize data | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (G) organize, analyze, evaluate, make inferences, and predict trends from data | (ii) analyze data | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (G) organize, analyze, evaluate, make inferences, and predict trends from data | (iii) evaluate data | | |

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| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (G) organize, analyze, evaluate, make inferences, and predict trends from data | (iv) make inferences from data | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (G) organize, analyze, evaluate, make inferences, and predict trends from data | (v) predict trends from data | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (H) use mathematical procedures such as algebra, statistics, scientific notation, and significant figures to analyze data using the International System (SI) units | (i) use mathematical procedures to analyze data using the International System (SI) units | | |
| (2) Scientific processes. The student uses scientific methods during laboratory and field investigations. The student is expected to: | (I) communicate valid conclusions supported by data using several formats such as technical reports, lab reports, labeled drawings, graphic organizers, journals, presentations, and technical posters | (i) communicate valid conclusions supported by data using several formats | | |
| (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 | (iii) in all fields of science, analyze 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 | (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 | (vii) in all fields of science, evaluate 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 | (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 | | |

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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: | (D) evaluate the impact of research on scientific thought, society, and public policy | (i) evaluate the impact of research on scientific thought | | |
| (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 research on scientific thought, society, and public policy | (ii) evaluate the impact of research on society | | |
| (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 research on scientific thought, society, and public policy | (iii) evaluate the impact of research on public policy | | |
| (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) explore careers and collaboration among scientists in Earth and space sciences | (i) explore careers in Earth sciences | | |
| (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) explore careers and collaboration among scientists in Earth and space sciences | (ii) explore careers in space sciences | | |

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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: | (E) explore careers and collaboration among scientists in Earth and space sciences | (iii) explore collaboration among scientists in Earth sciences | | |
| (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) explore careers and collaboration among scientists in Earth and space sciences | (iv) explore collaboration among scientists in space sciences | | |
| (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) learn and understand the contributions of scientists to the historical development of Earth and space sciences | (i) learn the contributions of scientists to the historical development of Earth sciences | | |
| (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) learn and understand the contributions of scientists to the historical development of Earth and space sciences | (ii) learn the contributions of scientists to the historical development of space sciences | | |
| (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) learn and understand the contributions of scientists to the historical development of Earth and space sciences | (iii) understand the contributions of scientists to the historical development of Earth sciences | | |

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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: | (F) learn and understand the contributions of scientists to the historical development of Earth and space sciences | (iv) understand the contributions of scientists to the historical development of space sciences | | |
| (4) Earth in space and time. The student knows how Earth-based and space-based astronomical observations reveal differing theories about the structure, scale, composition, origin, and history of the universe. The student is expected to: | (A) evaluate the evidence concerning the Big Bang model such as red shift and cosmic microwave background radiation and current theories of the evolution of the universe, including estimates for the age of the universe | (i) evaluate the evidence concerning the Big Bang model | | |
| (4) Earth in space and time. The student knows how Earth-based and space-based astronomical observations reveal differing theories about the structure, scale, composition, origin, and history of the universe. The student is expected to: | (A) evaluate the evidence concerning the Big Bang model such as red shift and cosmic microwave background radiation and current theories of the evolution of the universe, including estimates for the age of the universe | (ii) evaluate current theories of the evolution of the universe, including estimates for the age of the universe | | |
| (4) Earth in space and time. The student knows how Earth-based and space-based astronomical observations reveal differing theories about the structure, scale, composition, origin, and history of the universe. The student is expected to: | (B) explain how the Sun and other stars transform matter into energy through nuclear fusion | (i) explain how the Sun transform[s] matter into energy through nuclear fusion | | |
| (4) Earth in space and time. The student knows how Earth-based and space-based astronomical observations reveal differing theories about the structure, scale, composition, origin, and history of the universe. The student is expected to: | (B) explain how the Sun and other stars transform matter into energy through nuclear fusion | (ii) explain how stars transform matter into energy through nuclear fusion | | |

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| (4) Earth in space and time. The student knows how Earth-based and space-based astronomical observations reveal differing theories about the structure, scale, composition, origin, and history of the universe. The student is expected to: | (C) investigate the process by which a supernova can lead to the formation of successive generation stars and planets | (i) investigate the process by which a supernova can lead to the formation of successive generation stars | | |
| (4) Earth in space and time. The student knows how Earth-based and space-based astronomical observations reveal differing theories about the structure, scale, composition, origin, and history of the universe. The student is expected to: | (C) investigate the process by which a supernova can lead to the formation of successive generation stars and planets | (ii) investigate the process by which a supernova can lead to the formation of successive generation planets | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (A) analyze how gravitational condensation of solar nebular gas and dust can lead to the accretion of planetesimals and protoplanets | (i) analyze how gravitational condensation of solar nebular gas and dust can lead to the accretion of planetesimals | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (A) analyze how gravitational condensation of solar nebular gas and dust can lead to the accretion of planetesimals and protoplanets | (ii) analyze how gravitational condensation of solar nebular gas and dust can lead to the accretion of protoplanets | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (B) investigate thermal energy sources, including kinetic heat of impact accretion, gravitational compression, and radioactive decay, which are thought to allow protoplanet differentiation into layers | (i) investigate thermal energy sources, including kinetic heat of impact accretion which [is] thought to allow protoplanet differentiation into layers | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (B) investigate thermal energy sources, including kinetic heat of impact accretion, gravitational compression, and radioactive decay, which are thought to allow protoplanet differentiation into layers | (ii) investigate thermal energy sources, including gravitational compression which [is] thought to allow protoplanet differentiation into layers | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (B) investigate thermal energy sources, including kinetic heat of impact accretion, gravitational compression, and radioactive decay, which are thought to allow protoplanet differentiation into layers | (iii) investigate thermal energy sources, including radioactive decay which [is] thought to allow protoplanet differentiation into layers | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (C) contrast the characteristics of comets, asteroids, and meteoroids and their positions in the solar system, including the orbital regions of the terrestrial planets, the asteroid belt, gas giants, Kuiper Belt, and Oort Cloud | (i) contrast the characteristics of comets, asteroids, and meteoroids | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (C) contrast the characteristics of comets, asteroids, and meteoroids and their positions in the solar system, including the orbital regions of the terrestrial planets, the asteroid belt, gas giants, Kuiper Belt, and Oort Cloud | (ii) contrast [the] positions [of comets, asteroids, and meteoroids] in the solar system, including the orbital regions of the terrestrial planets | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (C) contrast the characteristics of comets, asteroids, and meteoroids and their positions in the solar system, including the orbital regions of the terrestrial planets, the asteroid belt, gas giants, Kuiper Belt, and Oort Cloud | (iii) contrast [the] positions [of comets, asteroids, and meteoroids] in the solar system, including the asteroid belt | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (C) contrast the characteristics of comets, asteroids, and meteoroids and their positions in the solar system, including the orbital regions of the terrestrial planets, the asteroid belt, gas giants, Kuiper Belt, and Oort Cloud | (iv) contrast [the] positions [of comets, asteroids, and meteoroids] in the solar system, including gas giants | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (C) contrast the characteristics of comets, asteroids, and meteoroids and their positions in the solar system, including the orbital regions of the terrestrial planets, the asteroid belt, gas giants, Kuiper Belt, and Oort Cloud | (v) contrast [the] positions [of comets, asteroids, and meteoroids] in the solar system, including Kuiper Belt | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (C) contrast the characteristics of comets, asteroids, and meteoroids and their positions in the solar system, including the orbital regions of the terrestrial planets, the asteroid belt, gas giants, Kuiper Belt, and Oort Cloud | (vi) contrast [the] positions [of comets, asteroids, and meteoroids] in the solar system, including Oort Cloud | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (D) explore the historical and current hypotheses for the origin of the Moon, including the collision of Earth with a Mars-sized planetesimal | (i) explore the historical hypotheses for the origin of the Moon, including the collision of Earth with a Mars-sized planetesimal | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (D) explore the historical and current hypotheses for the origin of the Moon, including the collision of Earth with a Mars-sized planetesimal | (ii) explore the current hypotheses for the origin of the Moon | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (i) compare terrestrial planets to gas-giant planets in the solar system, including structure | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (ii) compare terrestrial planets to gas-giant planets in the solar system, including composition | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (iii) compare terrestrial planets to gas-giant planets in the solar system, including size | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (iv) compare terrestrial planets to gas-giant planets in the solar system, including density | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (v) compare terrestrial planets to gas-giant planets in the solar system, including orbit | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (vi) compare terrestrial planets to gas-giant planets in the solar system, including surface features | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (vii) compare terrestrial planets to gas-giant planets in the solar system, including tectonic activity | | |

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| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (viii) compare terrestrial planets to gas-giant planets in the solar system, including temperature | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (E) compare terrestrial planets to gas-giant planets in the solar system, including structure, composition, size, density, orbit, surface features, tectonic activity, temperature, and suitability for life | (ix) compare terrestrial planets to gas-giant planets in the solar system, including suitability for life | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (F) compare extra-solar planets with planets in our solar system and describe how such planets are detected | (i) compare extra-solar planets with planets in our solar system | | |
| (5) Earth in space and time. The student understands the solar nebular accretionary disk model. The student is expected to: | (F) compare extra-solar planets with planets in our solar system and describe how such planets are detected | (ii) describe how [extra-solar planets] are detected | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (A) analyze the changes of Earth's atmosphere that could have occurred through time from the original hydrogen-helium atmosphere, the carbon dioxide-water vapor-methane atmosphere, and the current nitrogen-oxygen atmosphere | | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (B) evaluate the role of volcanic outgassing and impact of water-bearing comets in developing Earth's atmosphere and hydrosphere | (i) evaluate the role of volcanic outgassing in developing Earth's atmosphere | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (B) evaluate the role of volcanic outgassing and impact of water-bearing comets in developing Earth's atmosphere and hydrosphere | (ii) evaluate the role of [the] impact of water-bearing comets in developing Earth's atmosphere | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (B) evaluate the role of volcanic outgassing and impact of water-bearing comets in developing Earth's atmosphere and hydrosphere | (iii) evaluate the role of volcanic outgassing in developing Earth's hydrosphere | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (B) evaluate the role of volcanic outgassing and impact of water-bearing comets in developing Earth's atmosphere and hydrosphere | (iv) evaluate the role of [the] impact of water-bearing comets in developing Earth's hydrosphere | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (C) investigate how the formation of atmospheric oxygen and the ozone layer impacted the formation of the geosphere and biosphere | (i) investigate how the formation of atmospheric oxygen impacted the formation of the geosphere | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (C) investigate how the formation of atmospheric oxygen and the ozone layer impacted the formation of the geosphere and biosphere | (ii) investigate how the formation of the ozone layer impacted the formation of the geosphere | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (C) investigate how the formation of atmospheric oxygen and the ozone layer impacted the formation of the geosphere and biosphere | (iii) investigate how the formation of atmospheric oxygen impacted the formation of the biosphere | | |

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| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (C) investigate how the formation of atmospheric oxygen and the ozone layer impacted the formation of the geosphere and biosphere | (iv) investigate how the formation of atmospheric the ozone layer impacted the formation of the biosphere | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (D) evaluate the evidence that Earth's cooling led to tectonic activity, resulting in continents and ocean basins | (i) evaluate the evidence that Earth's cooling led to tectonic activity, resulting in continents | | |
| (6) Earth in space and time. The student knows the evidence for how Earth's atmospheres, hydrosphere, and geosphere formed and changed through time. The student is expected to: | (D) evaluate the evidence that Earth's cooling led to tectonic activity, resulting in continents and ocean basins | (ii) evaluate the evidence that Earth's cooling led to tectonic activity, resulting in ocean basins | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (A) evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order | (i) evaluate relative dating methods using original horizontality to determine chronological order | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (A) evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order | (ii) evaluate relative dating methods using rock superposition to determine chronological order | | |

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| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (A) evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order | (iii) evaluate relative dating methods using lateral continuity to determine chronological order | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (A) evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order | (iv) evaluate relative dating methods using cross-cutting relationships to determine chronological order | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (A) evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order | (v) evaluate relative dating methods using unconformities to determine chronological order | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (A) evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order | (vi) evaluate relative dating methods using index fossils to determine chronological order | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (A) evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order | (vii) evaluate relative dating methods using biozones based on fossil succession to determine chronological order | | |

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| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (B) calculate the ages of igneous rocks from Earth and the Moon and meteorites using radiometric dating methods | (i) calculate the ages of igneous rocks from Earth using radiometric dating methods | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (B) calculate the ages of igneous rocks from Earth and the Moon and meteorites using radiometric dating methods | (ii) calculate the ages of igneous rocks from the Moon using radiometric dating methods | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (B) calculate the ages of igneous rocks from Earth and the Moon and meteorites using radiometric dating methods | (iii) calculate the ages of meteorites using radiometric dating methods | | |
| (7) Earth in space and time. The student knows that scientific dating methods of fossils and rock sequences are used to construct a chronology of Earth's history expressed in the geologic time scale. The student is expected to: | (C) understand how multiple dating methods are used to construct the geologic time scale, which represents Earth's approximate 4.6-billion-year history | | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (A) analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data | (i) analyze a variety of fossil types with regard to their appearance | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (A) analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data | (ii) analyze a variety of fossil types with regard to their completeness | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (A) analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data | (iii) analyze a variety of fossil types with regard to their alignment with scientific explanations in light of this fossil data | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (A) analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data | (iv) evaluate a variety of fossil types with regard to their appearance | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (A) analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data | (v) evaluate a variety of fossil types with regard to their completeness | | |

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| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (A) analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data | (vi) evaluate a variety of fossil types with regard to their alignment with scientific explanations in light of this fossil data | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (B) explain how sedimentation, fossilization, and speciation affect the degree of completeness of the fossil record | (i) explain how sedimentation affect[s] the degree of completeness of the fossil record | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (B) explain how sedimentation, fossilization, and speciation affect the degree of completeness of the fossil record | (ii) explain how fossilization affect[s] the degree of completeness of the fossil record | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (B) explain how sedimentation, fossilization, and speciation affect the degree of completeness of the fossil record | (iii) explain how speciation affect[s] the degree of completeness of the fossil record | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (C) evaluate the significance of the terminal Permian and Cretaceous mass extinction events, including adaptive radiations of organisms after the events | (i) evaluate the significance of the terminal Permian mass extinction events, including adaptive radiations of organisms after the events | | |
| (8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to: | (C) evaluate the significance of the terminal Permian and Cretaceous mass extinction events, including adaptive radiations of organisms after the events | (ii) evaluate the significance of the terminal Cretaceous mass extinction event, including adaptive radiations of organisms after the events | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (i) evaluate heat transfer through Earth's subsystems by radiation and include its role in ocean circulation | | |

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| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (ii) evaluate heat transfer through Earth's subsystems by radiation and include its role in weather | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (iii) evaluate heat transfer through Earth's subsystems by radiation and include its role in climate | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (iv) evaluate heat transfer through Earth's subsystems by convection and include its role in volcanism | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (v) evaluate heat transfer through Earth's subsystems by convection and include its role in plate tectonics | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (vi) evaluate heat transfer through Earth's subsystems by convection and include its role in ocean circulation | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (vii) evaluate heat transfer through Earth's subsystems by convection and include its role in climate | | |

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| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (viii) evaluate heat transfer through Earth's subsystems by convection and include its role in weather | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (ix) evaluate heat transfer through Earth's subsystems by conduction and include its role in volcanism | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (x) evaluate heat transfer through Earth's subsystems by conduction and include its role in plate tectonics | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (xi) evaluate heat transfer through Earth's subsystems by conduction and include its role in weather | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (A) evaluate heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate | (xii) evaluate heat transfer through Earth's subsystems by conduction and include its role in climate | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (i) examine the chemical structure of Earth's crust, including the lithosphere | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (ii) examine the physical structure of Earth's crust, including the lithosphere | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (iii) examine the thermal structure of Earth's crust, including the lithosphere | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (iv) examine the chemical structure of Earth's mantle, including the lithosphere | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (v) examine the physical structure of Earth's mantle, including the lithosphere | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (vi) examine the thermal structure of Earth's mantle, including the lithosphere | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (vii) examine the chemical structure of Earth's core | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (viii) examine the physical structure of Earth's core | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (ix) examine the thermal structure of Earth's core | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (x) examine the chemical structure of Earth's mantle, including the asthenosphere | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (xi) examine the physical structure of Earth's mantle, including the asthenosphere | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (B) examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere | (xii) examine the thermal structure of Earth's mantle, including the asthenosphere | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (C) explain how scientists use geophysical methods such as seismic wave analysis, gravity, and magnetism to interpret Earth's structure | (i) explain how scientists use geophysical methods to interpret Earth's structure | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (D) describe the formation and structure of Earth's magnetic field, including its interaction with charged solar particles to form the Van Allen belts and auroras | (i) describe the formation of Earth's magnetic field, including its interaction with charged solar particles to form the Van Allen belts | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (D) describe the formation and structure of Earth's magnetic field, including its interaction with charged solar particles to form the Van Allen belts and auroras | (ii) describe the formation of Earth's magnetic field, including its interaction with charged solar particles to form auroras | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (D) describe the formation and structure of Earth's magnetic field, including its interaction with charged solar particles to form the Van Allen belts and auroras | (iii) describe the structure of Earth's magnetic field, including its interaction with charged solar particles to form the Van Allen belts | | |
| (9) Solid Earth. The student knows Earth's interior is differentiated chemically, physically, and thermally. The student is expected to: | (D) describe the formation and structure of Earth's magnetic field, including its interaction with charged solar particles to form the Van Allen belts and auroras | (iv) describe the structure of Earth's magnetic field, including its interaction with charged solar particles to form auroras | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (A) investigate how new conceptual interpretations of data and innovative geophysical technologies led to the current theory of plate tectonics | (i) investigate how new conceptual interpretations of data led to the current theory of plate tectonics | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (A) investigate how new conceptual interpretations of data and innovative geophysical technologies led to the current theory of plate tectonics | (ii) investigate how innovative geophysical technologies led to the current theory of plate tectonics | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (B) describe how heat and rock composition affect density within Earth's interior and how density influences the development and motion of Earth's tectonic plates | (i) describe how heat affect[s] density within Earth's interior | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (B) describe how heat and rock composition affect density within Earth's interior and how density influences the development and motion of Earth's tectonic plates | (ii) describe how rock composition affect[s] density within Earth's interior | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (B) describe how heat and rock composition affect density within Earth's interior and how density influences the development and motion of Earth's tectonic plates | (iii) describe how density influences the development of Earth's tectonic plates | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (B) describe how heat and rock composition affect density within Earth's interior and how density influences the development and motion of Earth's tectonic plates | (iv) describe how density influences the motion of Earth's tectonic plates | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (i) explain how plate tectonics accounts for geologic processes, including sea floor spreading | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (ii) explain how plate tectonics accounts for geologic features, including ocean ridges | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (iii) explain how plate tectonics accounts for geologic features, including rift valleys | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (iv) explain how plate tectonics accounts for geologic features, including subduction zones | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (v) explain how plate tectonics accounts for geologic processes, including earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (vi) explain how plate tectonics accounts for geologic features, including volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (vii) explain how plate tectonics accounts for geologic features, including mountain ranges | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (viii) explain how plate tectonics accounts for geologic features, including hot spots | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (C) explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents | (ix) explain how plate tectonics accounts for geologic features, including hydrothermal vents | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (D) calculate the motion history of tectonic plates using equations relating rate, time, and distance to predict future motions, locations, and resulting geologic features | (i) calculate the motion history of tectonic plates using equations relating rate, time, and distance to predict future motions | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (D) calculate the motion history of tectonic plates using equations relating rate, time, and distance to predict future motions, locations, and resulting geologic features | (ii) calculate the motion history of tectonic plates using equations relating rate, time, and distance to predict future locations | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (D) calculate the motion history of tectonic plates using equations relating rate, time, and distance to predict future motions, locations, and resulting geologic features | (iii) calculate the motion history of tectonic plates using equations relating rate, time, and distance to predict resulting geologic features | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (i) distinguish the location of convergent plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (ii) distinguish the type of convergent plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (iii) distinguish the relative motion of convergent plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (iv) distinguish the location of divergent plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (v) distinguish the type of divergent plate boundaries using evidence from the distribution of earthquakes | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (vi) distinguish the relative motion of divergent plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (vii) distinguish the location of transform plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (viii) distinguish the type of transform plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (ix) distinguish the relative motion of transform plate boundaries using evidence from the distribution of earthquakes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (x) distinguish the location of convergent plate boundaries using evidence from the distribution of volcanoes | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xi) distinguish the type of convergent plate boundaries using evidence from the distribution of volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xii) distinguish the relative motion of convergent plate boundaries using evidence from the distribution of volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xiii) distinguish the location of divergent plate boundaries using evidence from the distribution of volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xiv) distinguish the type of divergent plate boundaries using evidence from the distribution of volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xv) distinguish the relative motion of divergent plate boundaries using evidence from the distribution of volcanoes | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xvi) distinguish the location of transform plate boundaries using evidence from the distribution of volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xvii) distinguish the type of transform plate boundaries using evidence from the distribution of volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (E) distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes | (xviii) distinguish the relative motion of transform plate boundaries using evidence from the distribution of volcanoes | | |
| (10) Solid Earth. The student knows that plate tectonics is the global mechanism for major geologic processes and that heat transfer, governed by the principles of thermodynamics, is the driving force. The student is expected to: | (F) evaluate the role of plate tectonics with respect to long-term global changes in Earth's subsystems such as continental buildup, glaciation, sea level fluctuations, mass extinctions, and climate change | (i) evaluate the role of plate tectonics with respect to long-term global changes in Earth's subsystems | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (A) compare the roles of erosion and deposition through the actions of water, wind, ice, gravity, and igneous activity by lava in constantly reshaping Earth's surface | (i) compare the roles of erosion and deposition through the actions of water in constantly reshaping Earth's surface | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (A) compare the roles of erosion and deposition through the actions of water, wind, ice, gravity, and igneous activity by lava in constantly reshaping Earth's surface | (ii) compare the roles of erosion and deposition through the actions of wind in constantly reshaping Earth's surface | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (A) compare the roles of erosion and deposition through the actions of water, wind, ice, gravity, and igneous activity by lava in constantly reshaping Earth's surface | (iii) compare the roles of erosion and deposition through the actions of ice in constantly reshaping Earth's surface | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (A) compare the roles of erosion and deposition through the actions of water, wind, ice, gravity, and igneous activity by lava in constantly reshaping Earth's surface | (iv) compare the roles of erosion and deposition through the actions of gravity in constantly reshaping Earth's surface | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (A) compare the roles of erosion and deposition through the actions of water, wind, ice, gravity, and igneous activity by lava in constantly reshaping Earth's surface | (v) compare the roles of erosion and deposition through the actions of igneous activity by lava in constantly reshaping Earth's surface | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (B) explain how plate tectonics accounts for geologic surface processes and features, including folds, faults, sedimentary basin formation, mountain building, and continental accretion | (i) explain how plate tectonics accounts for geologic surface processes, including sedimentary basin formation | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (B) explain how plate tectonics accounts for geologic surface processes and features, including folds, faults, sedimentary basin formation, mountain building, and continental accretion | (ii) explain how plate tectonics accounts for geologic surface processes, including mountain building | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (B) explain how plate tectonics accounts for geologic surface processes and features, including folds, faults, sedimentary basin formation, mountain building, and continental accretion | (iii) explain how plate tectonics accounts for geologic surface processes, including continental accretion | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (B) explain how plate tectonics accounts for geologic surface processes and features, including folds, faults, sedimentary basin formation, mountain building, and continental accretion | (iv) explain how plate tectonics accounts for geologic surface features, including folds | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (B) explain how plate tectonics accounts for geologic surface processes and features, including folds, faults, sedimentary basin formation, mountain building, and continental accretion | (v) explain how plate tectonics accounts for geologic surface features, including faults | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (C) analyze changes in continental plate configurations such as Pangaea and their impact on the biosphere, atmosphere, and hydrosphere through time | (i) analyze changes in continental plate configurations and their impact on the biosphere through time | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (C) analyze changes in continental plate configurations such as Pangaea and their impact on the biosphere, atmosphere, and hydrosphere through time | (ii) analyze changes in continental plate configurations and their impact on the atmosphere through time | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (C) analyze changes in continental plate configurations such as Pangaea and their impact on the biosphere, atmosphere, and hydrosphere through time | (iii) analyze changes in continental plate configurations and their impact on the hydrosphere through time | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (D) interpret Earth surface features using a variety of methods such as satellite imagery, aerial photography, and topographic and geologic maps using appropriate technologies | (i) interpret Earth surface features using a variety of methods using appropriate technologies | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (E) evaluate the impact of changes in Earth's subsystems on humans such as earthquakes, tsunamis, volcanic eruptions, hurricanes, flooding, and storm surges and the impact of humans on Earth's subsystems such as population growth, fossil fuel burning, and use of fresh water | (i) evaluate the impact of changes in Earth's subsystems on humans | | |
| (11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to: | (E) evaluate the impact of changes in Earth's subsystems on humans such as earthquakes, tsunamis, volcanic eruptions, hurricanes, flooding, and storm surges and the impact of humans on Earth's subsystems such as population growth, fossil fuel burning, and use of fresh water | (ii) evaluate the impact of humans on Earth's subsystems | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (A) evaluate how the use of energy, water, mineral, and rock resources affects Earth's subsystems | (i) evaluate how the use of energy resources affects Earth's subsystems | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (A) evaluate how the use of energy, water, mineral, and rock resources affects Earth's subsystems | (ii) evaluate how the use of water resources affects Earth's subsystems | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (A) evaluate how the use of energy, water, mineral, and rock resources affects Earth's subsystems | (iii) evaluate how the use of mineral resources affects Earth's subsystems | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (A) evaluate how the use of energy, water, mineral, and rock resources affects Earth's subsystems | (iv) evaluate how the use of rock resources affects Earth's subsystems | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (B) describe the formation of fossil fuels, including petroleum and coal | (i) describe the formation of fossil fuels, including petroleum | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (B) describe the formation of fossil fuels, including petroleum and coal | (ii) describe the formation of fossil fuels, including coal | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (C) discriminate between renewable and nonrenewable resources based upon rate of formation and use | (i) discriminate between renewable and nonrenewable resources based upon rate of formation | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (C) discriminate between renewable and nonrenewable resources based upon rate of formation and use | (ii) discriminate between renewable and nonrenewable resources based upon rate of use | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (D) analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs | (i) analyze the economics of resources from discovery to disposal, including technological advances | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (D) analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs | (ii) analyze the economics of resources from discovery to disposal, including resource type | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (D) analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs | (iii) analyze the economics of resources from discovery to disposal, including concentration | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (D) analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs | (iv) analyze the economics of resources from discovery to disposal, including location | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (D) analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs | (v) analyze the economics of resources from discovery to disposal, including waste disposal | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (D) analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs | (vi) analyze the economics of resources from discovery to disposal, including recycling | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (D) analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs | (vii) analyze the economics of resources from discovery to disposal, including environmental cost | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (E) explore careers that involve the exploration, extraction, production, use, and disposal of Earth's resources | (i) explore careers that involve the exploration of Earth's resources | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (E) explore careers that involve the exploration, extraction, production, use, and disposal of Earth's resources | (ii) explore careers that involve the extraction of Earth's resources | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (E) explore careers that involve the exploration, extraction, production, use, and disposal of Earth's resources | (iii) explore careers that involve the production of Earth's resources | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (E) explore careers that involve the exploration, extraction, production, use, and disposal of Earth's resources | (iv) explore careers that involve the use of Earth's resources | | |
| (12) Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to: | (E) explore careers that involve the exploration, extraction, production, use, and disposal of Earth's resources | (v) explore careers that involve the disposal of Earth's resources | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (A) quantify the components and fluxes within the hydrosphere such as changes in polar ice caps and glaciers, salt water incursions, and groundwater levels in response to precipitation events or excessive pumping | (i) quantify the components within the hydrosphere in response to precipitation events or excessive pumping | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (A) quantify the components and fluxes within the hydrosphere such as changes in polar ice caps and glaciers, salt water incursions, and groundwater levels in response to precipitation events or excessive pumping | (ii) quantify the fluxes within the hydrosphere in response to precipitation events or excessive pumping | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (B) analyze how global ocean circulation is the result of wind, tides, the Coriolis effect, water density differences, and the shape of the ocean basins | (i) analyze how global ocean circulation is the result of wind | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (B) analyze how global ocean circulation is the result of wind, tides, the Coriolis effect, water density differences, and the shape of the ocean basins | (ii) analyze how global ocean circulation is the result of tides | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (B) analyze how global ocean circulation is the result of wind, tides, the Coriolis effect, water density differences, and the shape of the ocean basins | (iii) analyze how global ocean circulation is the result of the Coriolis effect | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (B) analyze how global ocean circulation is the result of wind, tides, the Coriolis effect, water density differences, and the shape of the ocean basins | (iv) analyze how global ocean circulation is the result of water density differences | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (B) analyze how global ocean circulation is the result of wind, tides, the Coriolis effect, water density differences, and the shape of the ocean basins | (v) analyze how global ocean circulation is the result of the shape of the ocean basins | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (C) analyze the empirical relationship between the emissions of carbon dioxide, atmospheric carbon dioxide levels, and the average global temperature trends over the past 150 years | | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (D) discuss mechanisms and causes such as selective absorbers, major volcanic eruptions, solar luminance, giant meteorite impacts, and human activities that result in significant changes in Earth's climate | (i) discuss mechanisms that result in significant changes in Earth's climate | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (D) discuss mechanisms and causes such as selective absorbers, major volcanic eruptions, solar luminance, giant meteorite impacts, and human activities that result in significant changes in Earth's climate | (ii) discuss causes that result in significant changes in Earth's climate | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (E) investigate the causes and history of eustatic sea-level changes that result in transgressive and regressive sedimentary sequences | (i) investigate the causes of eustatic sea-level changes that result in transgressive sedimentary sequences | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (E) investigate the causes and history of eustatic sea-level changes that result in transgressive and regressive sedimentary sequences | (ii) investigate the history of eustatic sea-level changes that result in transgressive sedimentary sequences | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (E) investigate the causes and history of eustatic sea-level changes that result in transgressive and regressive sedimentary sequences | (iii) investigate the causes of eustatic sea-level changes that result in regressive sedimentary sequences | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (E) investigate the causes and history of eustatic sea-level changes that result in transgressive and regressive sedimentary sequences | (iv) investigate the history of eustatic sea-level changes that result in regressive sedimentary sequences | | |
| (13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to: | (F) discuss scientific hypotheses for the origin of life by abiotic chemical processes in an aqueous environment through complex geochemical cycles given the complexity of living systems | | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (A) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric transparency, surface albedo, Earth's tilt, duration of insolation, and differences in atmospheric and surface absorption of energy | (i) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric transparency | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (A) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric transparency, surface albedo, Earth's tilt, duration of insolation, and differences in atmospheric and surface absorption of energy | (ii) analyze the uneven distribution of solar energy on Earth's surface, including differences in surface albedo | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (A) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric transparency, surface albedo, Earth's tilt, duration of insolation, and differences in atmospheric and surface absorption of energy | (iii) analyze the uneven distribution of solar energy on Earth's surface, including differences in Earth's tilt | | |

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| **TEKS (Knowledge and Skills)** | **Student Expectation** | **Breakout** | **Element** | **Subelement** |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (A) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric transparency, surface albedo, Earth's tilt, duration of insolation, and differences in atmospheric and surface absorption of energy | (iv) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric duration of insolation | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (A) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric transparency, surface albedo, Earth's tilt, duration of insolation, and differences in atmospheric and surface absorption of energy | (v) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric absorption of energy | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (A) analyze the uneven distribution of solar energy on Earth's surface, including differences in atmospheric transparency, surface albedo, Earth's tilt, duration of insolation, and differences in atmospheric and surface absorption of energy | (vi) analyze the uneven distribution of solar energy on Earth's surface, including differences in surface absorption of energy | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (B)investigate how the atmosphere is heated from Earth's surface due to absorption of solar energy, which is re-radiated as thermal energy and trapped by selective absorbers | | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (C) explain how thermal energy transfer between the ocean and atmosphere drives surface currents, thermohaline currents, and evaporation that influence climate | (i) explain how thermal energy transfer between the ocean and atmosphere drives surface currents that influence climate | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (C) explain how thermal energy transfer between the ocean and atmosphere drives surface currents, thermohaline currents, and evaporation that influence climate | (ii) explain how thermal energy transfer between the ocean and atmosphere drives thermohaline currents that influence climate | | |
| (14) Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to: | (C) explain how thermal energy transfer between the ocean and atmosphere drives surface currents, thermohaline currents, and evaporation that influence climate | (iii) explain how thermal energy transfer between the ocean and atmosphere drives evaporation that influence[s] climate | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (A) describe how changing surface-ocean conditions, including El Niño-Southern Oscillation, affect global weather and climate patterns | (i) describe how changing surface-ocean conditions, including El Niño-Southern Oscillation, affect global weather patterns | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (A) describe how changing surface-ocean conditions, including El Niño-Southern Oscillation, affect global weather and climate patterns | (ii) describe how changing surface-ocean conditions, including El Niño-Southern Oscillation, affect global climate patterns | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (B) investigate evidence such as ice cores, glacial striations, and fossils for climate variability and its use in developing computer models to explain present and predict future climates | (i) investigate evidence for climate variability | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (B) investigate evidence such as ice cores, glacial striations, and fossils for climate variability and its use in developing computer models to explain present and predict future climates | (ii) investigate [the] use [of climate variability evidence] in developing computer models to explain present climates | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (B) investigate evidence such as ice cores, glacial striations, and fossils for climate variability and its use in developing computer models to explain present and predict future climates | (iii) investigate [the] use [of climate variability evidence] in developing computer models to predict future climates | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (C) quantify the dynamics of surface and groundwater movement such as recharge, discharge, evapotranspiration, storage, residence time, and sustainability | (i) quantify the dynamics of surface movement | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (C) quantify the dynamics of surface and groundwater movement such as recharge, discharge, evapotranspiration, storage, residence time, and sustainability | (ii) quantify the dynamics of groundwater movement | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (D) explain the global carbon cycle, including how carbon exists in different forms within the five subsystems and how these forms affect life | (i) explain the global carbon cycle, including how carbon exists in different forms within the five subsystems | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (D) explain the global carbon cycle, including how carbon exists in different forms within the five subsystems and how these forms affect life | (ii) explain the global carbon cycle, including how [different forms within the five subsystems] affect life | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (E) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity | (i) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (E) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity | (ii) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on sea level | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (E) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity | (iii) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on algal growth | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (E) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity | (iv) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature coral bleaching | | |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (E) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity | (v) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on hurricane intensity | | |

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| TEKS (Knowledge and Skills) | Student Expectation | Breakout | Element | Subelement |
| (15) Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to: | (E) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity | (vi) analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on biodiversity | | |