

Prepared by the State Board of Education Science TEKS Streamlining Committees

Final Recommendations, January 2017

These draft proposed revisions reflect the changes to the science Texas Essential Knowledge and Skills (TEKS) that have been recommended by State Board of Education-appointed TEKS streamlining committees for **Grade 3 - Grade 5**. Proposed deletions are shown in red font with strikethroughs (~~deletions~~). Text proposed to be moved from its current student expectation is shown in purple font with strikethrough (~~moved text~~) and is shown in the proposed new location in purple font with underlines (new text location). Recommendations to clarify language are shown in blue font with underlines (clarifying language). Green text identifies (technical edits).

Comments identified on the left-hand side link to explanations for the proposed changes. **To view a comment, click on the number of the comment or scroll to the end of the grade level or course.**

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§112.14. Science, Grade 3, **Adopted 2017.** ~~[Beginning with School Year 2010-2011.]~~

Comment ¹(a) Introduction.

~~(1) [(4)]~~ In Grade 3, students learn that the study of science uses appropriate tools and safe practices in planning and implementing investigations, asking and answering questions, collecting data by observing and measuring, and by using models to support scientific inquiry about the natural world.

- (A) Within the physical environment, students recognize that patterns, relationships, and cycles exist in matter. Students will investigate the physical properties of matter and will learn that changes occur. They explore mixtures and investigate light, sound, and heat/thermal energy in everyday life. Students manipulate objects by pushing and pulling to demonstrate changes in motion and position.
- (B) Within the physical environment, students investigate how the surface of Earth changes and provides resources that humans use. As students explore objects in the sky, they describe how relationships affect patterns and cycles on Earth. Students will construct models to demonstrate Sun, Earth, and Moon system relationships ~~[and will describe the Sun's role in the water cycle]~~ .
- (C) Within the living environment, students explore patterns, systems, and cycles within environments by investigating characteristics of organisms, life cycles, and interactions among all components of the natural environment. Students examine how the environment plays a key role in survival. Students know that when changes in the environment occur organisms may thrive, become ill, or perish.

~~(2) [(4)]~~ 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."

~~(3) [(2)]~~ Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.

~~(4) [(3)]~~ The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific methods, analyzing information, making informed decisions, and using tools to collect and record information while addressing the content and vocabulary in physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 60% of instructional time.

~~[(4)]~~ In Grade 3, students learn that the study of science uses appropriate tools and safe practices in planning and implementing investigations, asking and answering questions, collecting data by observing and measuring, and by using models to support scientific inquiry about the natural world.]

~~[(A)]~~ Students recognize that patterns, relationships, and cycles exist in matter. Students will investigate the physical properties of matter and will learn that changes occur. They explore mixtures and investigate light, sound, and heat/thermal energy in everyday life. Students manipulate objects by pushing and pulling to demonstrate changes in motion and position.]

~~[(B)]~~ Students investigate how the surface of Earth changes and provides resources that humans use. As students explore objects in the sky, they describe how relationships affect patterns and cycles on Earth. Students will construct models to demonstrate Sun, Earth, and Moon system relationships and will describe the Sun's role in the water cycle.]

~~[(C)]~~ Students explore patterns, systems, and cycles within environments by investigating characteristics of organisms, life cycles, and interactions among all components of the natural environment. Students examine how the environment plays a key role in survival. Students know that when changes in the environment occur organisms may thrive, become ill, or perish.]

(5) Statements containing the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(b) Knowledge and skills.

(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following school and home safety procedures and environmentally appropriate practices. The student is expected to:

Comment ²(A) demonstrate safe practices as described in the [TEA-approved safety standards \[Texas Safety Standards\]](#) during classroom and outdoor investigations [using safety equipment as appropriate, including safety goggles and gloves](#) [~~including observing a schoolyard habitat~~]; and

(B) make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics.

(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:

(A) plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world;

(B) collect [and record](#) data by observing and measuring using the metric system and recognize differences between observed and measured data;

(C) construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data;

(D) analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations;

(E) demonstrate that repeated investigations may increase the reliability of results; and

(F) communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.

(3) Scientific investigation and reasoning. The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. 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~~];

~~[(B) draw inferences and evaluate accuracy of product claims found in advertisements and labels such as for toys and food;]~~

(B) [~~(C)~~] represent the natural world using models such as volcanoes or Sun, Earth, and Moon system and identify their limitations, including size, properties, and materials; and

(C) [~~(D)~~] connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

(4) Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to [\[2\]](#)

~~[(A)]~~ collect, record, and analyze information using tools, including microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, [~~compasses,~~] magnets, collecting nets, notebooks, [~~sound recorders,~~] and Sun, Earth, and

Moon system models; timing devices, ~~[including clocks and stopwatches;]~~ and materials to support observation of habitats of organisms such as terrariums and aquariums; and

~~[(B) use safety equipment as appropriate, including safety goggles and gloves.]~~

(5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:

(A) measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float;

Comment ³(B) describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container;

Comment ⁴(C) predict, observe, and record changes in the state of matter caused by heating or cooling such as ice becoming liquid water or condensation forming on the outside of a glass of ice water; and

(D) explore and recognize that a mixture is created when two materials are combined such as gravel and sand or [and] metal and plastic paper clips.

(6) Force, motion, and energy. The student knows that forces cause change and that energy exists in many forms. The student is expected to:

(A) explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life;

(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects ~~[to show work being done]~~ such as swings, balls, ~~[pulleys,]~~ and wagons; and

(C) observe forces such as magnetism and gravity acting on objects.

(7) Earth and space. The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to:

(A) explore and record how soils are formed by weathering of rock and the decomposition of plant and animal remains;

(B) investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides; and

Comment ⁵~~[(C) identify and compare different landforms, including mountains, hills, valleys, and plains; and]~~

(C) [(D)] explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture and how resources may be conserved.

(8) Earth and space. The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:

(A) observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation;

(B) describe and illustrate the Sun as a star composed of gases that provides light and heat energy ~~[for the water cycle]~~ ;

(C) construct models that demonstrate the relationship of the Sun, Earth, and Moon including orbits and positions; and

(D) identify the planets in Earth's solar system and their position in relation to the Sun.

(9) Organisms and environments. The student knows ~~[that organisms have characteristics that help them survive]~~ and can describe patterns, cycles, systems, and relationships within the environments. The student is expected to:

- (A) observe and describe the physical characteristics of environments and how they support populations and communities of plants and animals within an ecosystem;
 - (B) identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field; and
 - (C) describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations.
- (10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to:
- (A) explore how structures and functions of plants and animals allow them to survive in a particular environment; and
 - ~~[(B) — explore that some characteristics of organisms are inherited such as the number of limbs on an animal or flower color and recognize that some behaviors are learned in response to living in a certain environment such as animals using tools to get food; and]~~
 - (B) ~~[(C)]~~ investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs.

¹ Reordering the paragraphs will vertically align the Introduction K-12 formatting.

² Changed wording to align K-8, as well as to provide safety resources without a cost for teachers/districts.

³ Keeping this standard as a separate Student Expectation is necessary as this is the first time the concept of gas is introduced into the curriculum.

⁴ Example is added for clarification and supports the deletion of 4(5)(B).

⁵ Landforms are slow changes to the surface of the Earth, not formed by rapid changes, which is the focus of the Third Grade SE. Fourth and Fifth Grade SE's address slow changes to the surface of the Earth. Landforms are additionally addressed in K-2 Social Studies.

§112.15. Science, Grade 4, **Adopted 2017**, ~~[Beginning with School Year 2010-2011.]~~

(a) Introduction.

Comment ¹(1) ~~[(4)]~~ In Grade 4, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and, based on new discoveries, are constantly being modified to more closely reflect the natural world.

Comment ²(A) Within the physical environment, students know about the physical properties of matter including mass, volume, states of matter, temperature, magnetism, and the ability to sink or float. Students will differentiate among forms of energy including mechanical, light, sound, and thermal energy. Students will explore electrical circuits and design descriptive investigations to explore the effect of force on objects.

(B) ~~[(A)]~~ Within the natural environment, students know that earth materials have properties that are constantly changing due to Earth's forces. The students learn that the natural world consists of resources, including renewable and nonrenewable, and their responsibility to conserve our natural resources for future generations. They will also explore Sun, Earth, and Moon relationships. The students will recognize that our major source of energy is the Sun.

(C) ~~[(B)]~~ Within the living environment, students know and understand that living organisms within an ecosystem interact with one another and with their environment. The students will recognize that plants and animals have basic needs, and they are met through a flow of energy known as food webs. Students will explore how all living organisms go through a life cycle and have structures that ~~[adaptations]~~ enable organisms to survive in their ecosystem.

~~(2) [(4)]~~ 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."

~~(3) [(2)]~~ Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.

~~(4) [(3)]~~ The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information, while addressing the major concepts and vocabulary, in the context of physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 50% of instructional time.

~~[(4)]~~ In Grade 4, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.]

~~[(A)]~~ Within the natural environment, students know that earth materials have properties that are constantly changing due to Earth's forces. The students learn that the natural world consists of resources, including renewable and nonrenewable, and their responsibility to conserve our natural resources for future generations. They will also explore Sun, Earth, and Moon relationships. The students will recognize that our major source of energy is the Sun.]

~~(B) Within the living environment, students know and understand that living organisms within an ecosystem interact with one another and with their environment. The students will recognize that plants and animals have basic needs, and they are met through a flow of energy known as food webs. Students will explore how all living organisms go through a life cycle and that adaptations enable organisms to survive in their ecosystem.~~

(5) Statements containing the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(b) Knowledge and skills.

(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations, following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:

Comment³(A) demonstrate safe practices and the use of safety equipment as described in the [TEA-approved safety standards](#) ~~[Texas Safety Standards]~~ during classroom and outdoor investigations [using safety equipment, including safety goggles and gloves, as appropriate](#); and

(B) make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans, and plastic.

(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:

(A) plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions;

(B) collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps;

(C) construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data;

(D) analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured;

(E) perform repeated investigations to increase the reliability of results; and

(F) communicate valid, oral, and written results supported by data.

(3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. 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]~~ ;

~~(B) draw inferences and evaluate accuracy of services and product claims found in advertisements and labels such as for toys, food, and sunscreen;~~

~~(B)~~ ~~(C)~~ represent the natural world using models such as [the water cycle and \[rivers,\]](#) stream tables ~~[; or fossils]~~ and identify their limitations, including accuracy and size; and

~~(C)~~ ~~(D)~~ connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

(4) Scientific investigation and reasoning. The student knows how to use a variety of tools, materials, equipment, and models to conduct science inquiry. The student is expected to ~~[;]~~

~~(A)~~ collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, mirrors, spring

scales, ~~pan balances, triple beam~~ balances, graduated cylinders, beakers, hot plates, meter sticks, ~~compasses,~~ magnets, collecting nets, and notebooks; timing devices, ~~including clocks and stopwatches;~~ and materials to support observation of habitats of organisms such as terrariums and aquariums. ~~;~~ ~~and~~

~~(B) use safety equipment as appropriate, including safety goggles and gloves.]~~

(5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:

(A) measure, compare, and contrast physical properties of matter, including ~~size,~~ mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float; ~~and~~

Comment ⁴~~(B) predict the changes caused by heating and cooling such as ice becoming liquid water and condensation forming on the outside of a glass of ice water; and~~

~~(B)~~ ~~(C)~~ compare and contrast a variety of mixtures, including ~~and~~ solutions ~~such as rocks in sand, sand in water, or sugar in water~~ .

(6) Force, motion, and energy. The student knows that energy exists in many forms and can be observed in cycles, patterns, and systems. The student is expected to:

(A) differentiate among forms of energy, including mechanical, sound, electrical, light, and ~~heat/~~ thermal;

(B) differentiate between conductors and insulators ~~of thermal and electrical energy;~~

(C) demonstrate that electricity travels in a closed path, creating an electrical circuit ~~;~~ ~~and explore an electromagnetic field~~ ; and

(D) design ~~a descriptive investigation~~ ~~[an experiment]~~ to ~~explore~~ ~~[test]~~ the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.

(7) Earth and space. The students know that Earth consists of useful resources and its surface is constantly changing. The student is expected to:

(A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants;

(B) observe and identify slow changes to Earth's surface caused by weathering, erosion, and deposition from water, wind, and ice; and

(C) identify and classify Earth's renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation.

(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:

Comment ⁵(A) measure, ~~and~~ record, ~~and predict~~ changes in weather ~~and make predictions using weather maps, weather symbols, and a map key~~ ;

(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process; and

(C) collect and analyze data to identify sequences and predict patterns of change in shadows, ~~tides,~~ seasons, and the observable appearance of the Moon over time.

(9) Organisms and environments. The student knows and understands that living organisms within an ecosystem interact with one another and with their environment. The student is expected to:

(A) investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food; and

- (B) describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web ~~[such as a fire in a forest]~~ .

Comment ⁶(10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures and behaviors that help them survive within their environment. The student is expected to:

Comment ⁷~~(A) explore how adaptations enable organisms to survive in their environment such as comparing birds' beaks and leaves on plants;~~

~~(A) (B)~~ explore and describe examples of ~~[demonstrate that some]~~ traits that ~~[likenesses between parents and offspring]~~ are inherited from parents to offspring, ~~[passed from generation to generation]~~ such as eye color and ~~[in humans]~~ shapes of leaves ~~[in plants. Other likenesses are]~~ and behaviors that are learned such as ~~[table manners or]~~ reading a book and a wolf pack teaching their pups to hunt effectively ~~[seals balancing balls on their noses]~~ ; and

~~(B) (C)~~ explore, illustrate, and compare life cycles in living organisms such as ~~[butterflies,]~~ beetles, crickets, radishes, or lima beans.

¹ Reordering the paragraphs will vertically align the Introduction K-12 formatting.

² Inserted paragraph to vertically align K-5, it is the only grade level lacking the physical environment introductory paragraph.

³ Changed wording to align K-8, as well as to provide safety resources without a cost for teachers/districts.

⁴ The Third Grade SE 3(5)(C) students predict, observe, and record changes in heating and cooling. This is at a higher level than the SE 4(5)(B).

⁵ Adds clarity to the SE and provides vertical alignment 3-5.

⁶ The addition of “and behaviors” better aligns overall expectation of concepts.

⁷ This SE is very similar in Third Grade 3(10)(A) and Fifth Grade 5(10)(A) as well as addressed in 4(10)(B) when discussing inherited traits. The committee strongly feels that removal of this SE does not create a gap in vertical alignment but allows time for a deeper understanding of structure/function of organisms (Third Grade) and inherited traits/learned behaviors (Fourth Grade). However, if the State Board of Education chooses to include this SE, the committee recommends the following wording: *Explore how structures and functions enable organisms to survive in their environment.* This will align structure and function as a common vocabulary for Grades 3-5.

§112.16. Science, Grade 5, Adopted 2017, ~~[Beginning with School Year 2010-2011.]~~

Comment ¹(a) **Introduction.**

~~(1) [(4)] In Grade 5, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.~~

~~(A) Within the physical environment, students learn about the physical properties of matter, including magnetism, physical states of matter, relative density, solubility in water, and the ability to conduct or insulate electrical and thermal [heat] energy. Students explore the uses of light, thermal, electrical, mechanical, and sound energies.~~

~~(B) Within the natural environment, students learn how changes occur on Earth's surface and that predictable patterns occur in the sky. Students learn that the natural world consists of resources, including nonrenewable and renewable [, and alternative energy sources] .~~

~~(C) Within the living environment, students learn that structure and function of organisms can improve the survival of members of a species. Students learn to differentiate between inherited traits and learned behaviors. [Students learn that life cycles occur in animals and plants and that the carbon dioxide-oxygen cycle occurs naturally to support the living environment.]~~

~~(2) [(4)] 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."~~

~~(3) [(2)] Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.~~

~~(4) [(3)] The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information, while addressing the major concepts and vocabulary, in the context of physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 50% of instructional time.~~

~~[(4)] In Grade 5, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.]~~

~~[(A)] Within the physical environment, students learn about the physical properties of matter, including magnetism, physical states of matter, relative density, solubility in water, and the ability to conduct or insulate electrical and heat energy. Students explore the uses of light, thermal, electrical, and sound energies.]~~

~~[(B)] Within the natural environment, students learn how changes occur on Earth's surface and that predictable patterns occur in the sky. Students learn that the natural world consists of resources, including nonrenewable, renewable, and alternative energy sources.]~~

~~[(C)] Within the living environment, students learn that structure and function of organisms can improve the survival of members of a species. Students learn to differentiate between inherited traits and learned behaviors. Students learn that life cycles occur in animals and~~

~~plants and that the carbon dioxide oxygen cycle occurs naturally to support the living environment.]~~

(5) Statements containing the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(b) Knowledge and skills.

(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:

Comment ²(A) demonstrate safe practices and the use of safety equipment as described in the [TEA-approved safety standards](#) [~~Texas Safety Standards~~] during classroom and outdoor investigations [using safety equipment, including safety goggles and gloves, as appropriate](#); and

(B) make informed choices in the conservation, disposal, and recycling of materials.

(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:

(A) describe, plan, and implement simple experimental investigations testing one variable;

(B) ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology;

(C) collect [and record](#) information [using](#) [~~by~~] detailed observations and accurate measuring;

(D) analyze and interpret information to construct reasonable explanations from direct (observable) [~~and indirect (inferred)~~] evidence;

(E) demonstrate that repeated investigations may increase the reliability of results;

(F) communicate valid conclusions in both written and verbal forms; and

(G) construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information.

(3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. 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~~];

~~[(B) evaluate the accuracy of the information related to promotional materials for products and services such as nutritional labels;]~~

~~(B) [(C)]~~ draw or develop a model that represents how something [~~works or looks~~] that cannot be seen such as [the Sun, Earth, and Moon system and formation of sedimentary rock](#) [~~how a soda dispensing machine works~~] [works or looks](#); and

~~(C) [(D)]~~ connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

(4) Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to [~~2~~]

~~[(A)]~~ collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, [~~pan balances, triple beam~~] balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices, [~~including~~

~~clocks and stopwatches;~~ and materials to support observations of habitats or organisms such as terrariums and aquariums. ~~;-and]~~

~~[(B) — use safety equipment, including safety goggles and gloves.]~~

- (5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:

Comment ³(A) classify matter based on measurable, testable, and observable physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy;

~~[(B) — identify the boiling and freezing/melting points of water on the Celsius scale;]~~

~~(B) [(C)]~~ demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand or sand and water; and

~~(C) [(D)]~~ identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water.

- (6) Force, motion, and energy. The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:

(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy;

(B) demonstrate that the flow of electricity in closed circuits ~~[requires a complete path through which an electric current can pass and]~~ can produce light, heat, and sound;

(C) demonstrate that light travels in a straight line until it strikes an object and is reflected or travels through one medium to another ~~[and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces]~~ and is refracted ~~[such as the appearance of an object when observed through water]~~; and

Comment ⁴(D) design a simple experimental investigation ~~[an experiment]~~ that tests the effect of force on an object.

- (7) Earth and space. The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to:

(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels; and

(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice. ~~[-]~~

Comment ⁵~~[(C) — identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels; and]~~

~~[(D) — identify fossils as evidence of past living organisms and the nature of the environments at the time using models.]~~

- (8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:

(A) differentiate between weather and climate;

(B) explain how the Sun and the ocean interact in the water cycle;

(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky; and

(D) identify and compare the physical characteristics of the Sun, Earth, and Moon.

- (9) Organisms and environments. The student knows that there are relationships, systems, and cycles within environments. The student is expected to:

- (A) observe the way organisms live and survive in their ecosystem by interacting with the living (includes once living) and non-living elements;
- (B) describe how the flow of energy within a food web, to including the roles of ~~derived from~~ the Sun, ~~used by~~ producers, ~~to create their own food, is transferred through a food chain and food web to~~ consumers, and decomposers;
- (C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways; and
- (D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models.

~~[(D) identify the significance of the carbon dioxide oxygen cycle to the survival of plants and animals.]~~

Comment ⁶(10)

Organisms and environments. The student knows that organisms ~~undergo similar life processes and~~ have structures and behaviors that help them survive within their environments. The student is expected to:

- (A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals; and
- (B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle. ~~[:and]~~

~~[(C) describe the differences between complete and incomplete metamorphosis of insects.]~~

¹ Reordering the paragraphs will vertically align the Introduction K-12 formatting.

² Changed wording to align K-8, as well as to provide safety resources without a cost for teachers/districts.

³ By adding the clarifying phrase “measurable, testable, and observable” the committee feels that mass can be accurately investigated. This is supported by multiple survey responses.

⁴ To align with process skill 5.2A.

⁵ Survey results initially supported the deletion of 5(7)(C) in concurrence with the committee. This is addressed in 6(7)(A) and supports streamlining of 5th grade TEKS.

⁶ With the removal of SE 5(10)(C) there is no longer a student expectation to support this part of the Knowledge and Skills statement. The addition of “and behaviors” better aligns overall expectation of concepts.