<table>
<thead>
<tr>
<th>2021 Knowledge and Skill Statement/Student Expectation</th>
<th>2021 Text</th>
<th>2017 Knowledge and Skill Statement/Student Expectation</th>
<th>2017 Text</th>
<th>Notes from TEA Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCIENCE.6.1</strong> Scientific and engineering practices</td>
<td>The student, for at least 40% of instructional time, uses questions, identifies problems, and plans and safely conducts investigations, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:</td>
<td>6.1</td>
<td>Scientific investigations and reasoning. The student, for at least 40% of instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate, ethical practices. The student is expected to:</td>
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<tr>
<td><strong>SCIENCE.6.1.A</strong> Ask and answer questions based on observations or information from observations, phenomena, model, or investigations;</td>
<td></td>
<td>6.2.A</td>
<td>Plan and conduct comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology.</td>
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<tr>
<td><strong>SCIENCE.6.1.B</strong> Use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;</td>
<td></td>
<td>6.2.B</td>
<td>Design and conduct experimental investigations by making observations, asking well-defined questions, formulating possible hypotheses, and using appropriate equipment and technology.</td>
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<tr>
<td><strong>SCIENCE.6.1.C</strong> Use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards;</td>
<td>6.1.A</td>
<td>Use appropriate safety equipment and practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards; and</td>
<td></td>
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<tr>
<td><strong>SCIENCE.6.1.D</strong> Use appropriate tools such as graduated cylinders, metric rulers, periodic tables, balances, scales, thermometers, temperature probes, laboratory ware, timing devices, prisms, hot plates, microscopes, clocks, life science hobbies, petri dishes, dissecting kits, magnets, spring scales or force sensors, tools that model wave behavior, satellite images, bird tees, and lab notebooks or journals;</td>
<td>6.1.B</td>
<td>Develop interpretable and replicable hypotheses, and identify advantages and limitations of models such as size, scale, properties, and materials; and</td>
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<tr>
<td><strong>SCIENCE.6.1.E</strong> Collect qualitative data using the International System of Units (SI) and qualitative data as evidence.</td>
<td>6.2.C</td>
<td>Collect and record data using the International System of Units (SI) and qualitative data as evidence.</td>
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<tr>
<td><strong>SCIENCE.6.1.F</strong> Construct and record data using the International System of Units (SI) and qualitative data as evidence.</td>
<td>6.2.D</td>
<td>Construct and record data using the International System of Units (SI) and qualitative data as evidence.</td>
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<tr>
<td><strong>SCIENCE.6.1.G</strong> Develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and</td>
<td>6.3.B</td>
<td>Use models to represent aspects of the natural world such as a model of Earth's layers;</td>
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<tr>
<td><strong>SCIENCE.6.1.H</strong> Distinguish between scientific hypotheses, theories, and laws.</td>
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<tr>
<td><strong>SCIENCE.6.2</strong> Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:</td>
<td>6.3.C</td>
<td>Develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and</td>
<td></td>
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<tr>
<td><strong>SCIENCE.6.2.A</strong> Identify advantages and limitations of models such as their size, scale, properties, and materials; and</td>
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<tr>
<td>SCIENCE.6.2.B</td>
<td>analyze data by identifying any significant descriptive statistical features, patterns, sources of error, or limitations.</td>
<td>6.2.E</td>
<td>analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.</td>
<td>Data analysis, explanations, and conclusions were split into separate Student Expectations, 6.2.B, 6.3.A, and 6.3.B.</td>
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<tr>
<td>SCIENCE.6.2.C</td>
<td>use mathematical calculations to assess quantitative relationships in data, and formulate valid conclusions</td>
<td>6.2.C</td>
<td>analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, as we in encourage critical thinking by the student.</td>
<td>Data analysis, explanations, and conclusions were split into separate Student Expectations, 6.2.B, 6.3.B, and 6.3.C.</td>
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<tr>
<td>SCIENCE.6.2.D</td>
<td>evaluate experimental and engineering designs.</td>
<td>6.2.D</td>
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<tr>
<td>SCIENCE.6.3</td>
<td>Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:</td>
<td>6.3</td>
<td>Scientific investigations and reasoning. The student uses critical thinking, scientific reasoning, and evaluation to make informed decisions and knows the contributions of relevant scientists. The student is expected to:</td>
<td>Critical thinking and the contributions of scientists were split into separate Knowledge and Skill statements, 6.3 and 6.4.</td>
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<tr>
<td>SCIENCE.6.3.A</td>
<td>develop explanations and propose solutions supported by data and models and integrate with scientific ideas, principles, and theories.</td>
<td>6.3.A</td>
<td>analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, as we encourage critical thinking by the student.</td>
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<tr>
<td>SCIENCE.6.3.B</td>
<td>communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and observational as to critical thinking by the student.</td>
<td>6.3.B</td>
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<tr>
<td>SCIENCE.6.3.C</td>
<td>support respectfully in scientific argumentation using applied scientific explanations and empirical evidence.</td>
<td>6.3.C</td>
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<tr>
<td>SCIENCE.6.4</td>
<td>Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. The student is expected to:</td>
<td>6.4</td>
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<tr>
<td>SCIENCE.6.4.A</td>
<td>relate the impact of past and current research on scientific thought and society, including the process of science, cost-benefit analysis, and contributions of diverse scientists as related to the content;</td>
<td>6.4.A</td>
<td>relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.</td>
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<tr>
<td>SCIENCE.6.4.B</td>
<td>make informed decisions by evaluating evidence from multiple appropriate sources to assess the credibility, accuracy, cost-effectiveness, and methods used;</td>
<td>6.4.B</td>
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<tr>
<td>SCIENCE.6.4.C</td>
<td>research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.</td>
<td>6.4.C</td>
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<tr>
<td>SCIENCE.6.5</td>
<td>recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. The student is expected to:</td>
<td>6.5</td>
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<tr>
<td>SCIENCE.6.5.A</td>
<td>analyze and apply opinions to understand and connect scientific phenomena or design solutions.</td>
<td>6.5.A</td>
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<tr>
<td>SCIENCE.6.5.B</td>
<td>identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.</td>
<td>6.5.B</td>
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<tr>
<td>SCIENCE.6.5.C</td>
<td>analyze how differences in scale, proportion, or quantity affect a system's structure or performance.</td>
<td>6.5.C</td>
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<tr>
<td>SCIENCE.6.5.D</td>
<td>examine and model the parts of a system and their interdependence in the function of the system.</td>
<td>6.5.D</td>
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<tr>
<td>SCIENCE.6.5.E</td>
<td>analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems.</td>
<td>6.5.E</td>
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<tr>
<td>SCIENCE.6.5.F</td>
<td>analyze and explain the complementary relationship between the structure and function of objects, organisms, and systems, and</td>
<td>6.5.F</td>
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</tbody>
</table>
### 6.5.G Analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

- **6.5**: Matter and energy. The student knows that matter is made of atoms, can be classified according to its properties, and can undergo changes. The student is expected to:
  - analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

### 6.6 Compare solids, liquids, and gases in terms of their structure, shape, volume, and kinetic energy of atoms and molecules.

- **6.6.A**: Compare solids, liquids, and gases in terms of their structure, shape, volume, and kinetic energy of atoms and molecules.

### 6.6.B Investigate the physical properties of matter to distinguish between pure substances, homogeneous mixtures (solutions), and heterogeneous mixtures.

- **6.6.B**: Investigate the physical properties of matter to distinguish between pure substances, homogeneous mixtures (solutions), and heterogeneous mixtures.

### 6.6.C Identify elements on the periodic table as metals, nonmetals, and metalloids, and use Earth elements based on their physical properties and importance to modern-day life.

- **6.6.C**: Identify elements on the periodic table as metals, nonmetals, and metalloids, according to and can undergo changes. The student is expected to:
  - identify elements on the periodic table as metals, nonmetals, and metalloids, according to their physical properties and importance to modern-day life.

### 6.6.D Compare the density of substances relative to various fluids; and

- **6.6.D**: Compare the density of substances relative to various fluids.

### 6.6.E Identify the formation of a new substance by using the evidence of a possible chemical change, including production of a gas, change in thermal energy, production of a precipitate, and color change.

- **6.6.E**: Identify the formation of a new substance by using the evidence of a possible chemical change, including production of a gas, change in thermal energy, production of a precipitate, and color change.

### 6.6.F Analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

- **6.6.F**: Analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

### 6.7 Force, motion, and energy. The student knows the nature of forces and their role in systems that experience stability or change. The student is expected to:

- **6.7**: Force, motion, and energy. The student knows the nature of forces and their role in systems that experience stability or change. The student is expected to:
  - identify and explain how forces act on objects, including gravity, friction, tension, applied forces, and normal forces, using real-world applications.

### SCIENCE 6.7.A Identify and explain how forces act on objects, including gravity, friction, tension, applied forces, and normal forces, using real-world applications.

- **6.7.A**: Identify and explain how forces act on objects, including gravity, friction, tension, applied forces, and normal forces, using real-world applications.

### SCIENCE 6.7.B Calculate the net force on an object in a horizontal or vertical direction using force diagrams and determine the forces that are balanced or unbalanced; and identify simultaneous forces that are equal in magnitude and opposite in direction that result from the interactions between objects using Newton's Third Law of Motion.

- **6.7.B**: Calculate the net force on an object in a horizontal or vertical direction using force diagrams and determine the forces that are balanced or unbalanced; and identify simultaneous forces that are equal in magnitude and opposite in direction that result from the interactions between objects using Newton's Third Law of Motion.

### SCIENCE 6.7.C Investigate and describe applications of Newton's three laws of motion such as in vehicle restraints, sports activities, amusement park rides, Earth's rotational activities, and rocket launches.

- **6.7.C**: Investigate and describe applications of Newton's three laws of motion such as in vehicle restraints, sports activities, amusement park rides, Earth's rotational activities, and rocket launches.

### SCIENCE 6.8 Force, motion, and energy. The student knows that the total energy in systems is conserved through energy transfers and transformations. The student is expected to:

- **6.8**: Force, motion, and energy. The student knows that the total energy in systems is conserved through energy transfers and transformations. The student is expected to:
  - compare and contrast gravitational, elastic, and chemical potential energies with kinetic energy.

### SCIENCE 6.8.A Compare and contrast gravitational, elastic, and chemical potential energies with kinetic energy.

- **6.8.A**: Compare and contrast gravitational, elastic, and chemical potential energies with kinetic energy.

### SCIENCE 6.8.B Understand that gravity is the force that governs the motion of our solar system, and

- **6.8.B**: Understand that gravity is the force that governs the motion of our solar system and

### SCIENCE 6.8.C Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:

- **6.8.C**: Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:
  - compare and contrast potential and kinetic energy.
SCIENCE.6.8.B Describe how energy is conserved through transfers and transformations in systems such as electrical circuits, food webs, amusement park rides, or biosynthesis; and

SCIENCE.6.8.C Explain how energy is transferred through transverse and longitudinal waves.

6.9.C Demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy.

6.8.B Identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces.


6.8.D Measure and graph changes in motion and.

6.8.E Investigate how inclined planes can be used to change the amount of force to move an object.

6.9 Conservation of energy is demonstrated using such energy systems as circuits, amusement park rides, or photosynthesis; and

6.8.C Energy is conserved and transformed in systems such as electrical circuits, food webs, amusement park rides, or biosynthesis; and


6.8.D Measure and graph changes in motion and.

6.8.E Investigate how inclined planes can be used to change the amount of force to move an object.

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6.9 Conservation of energy is demonstrated using such energy systems as circuits, amusement park rides, or photosynthesis; and

SCIENCE.6.9 Earth and space. The student models the cyclical movements of the Sun, Earth, and Moon and describes their effects. The student is expected to:

6.11 Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to:

SCIENCE.6.9.A Model and illustrate how the tilted Earth revolves around the Sun, causing changes in seasons; and

8.7.A Model and illustrate how the tilted Earth revolves around the Sun, causes day and night, and revolves around the Sun, causing changes in seasons; and

8.7.A Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:

8.7.C Model and illustrate how the tilted Earth revolves around the Sun, causing day and night, and revolves around the Sun, causing changes in seasons; and

8.7.A Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:

8.7.C Model and illustrate how the tilted Earth revolves around the Sun, causing day and night, and revolves around the Sun, causing changes in seasons; and

8.7.A Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:

SCIENCE.6.10 Earth and space. The student understands the rock cycle and the structure of Earth. The student is expected to:

6.10 Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:

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6.10 Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:

SCIENCE.6.10.A Differentiates between the biosphere, hydrosphere, atmosphere, and geosphere, and identify components of each system.

SCIENCE.6.10.B Model and describe the layers of Earth, including the inner core, outer core, mantle, and crust; and

6.10.A Model and describe the compositional and mechanical layers of Earth, including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere.

6.10.A Model and describe the compositional and mechanical layers of Earth, including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere.

6.10.A Model and describe the compositional and mechanical layers of Earth, including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere.

SCIENCE.6.10.C Describe how metamorphic, igneous, and sedimentary rocks form and change through geologic processes in the rock cycle.

6.10.B Identify rocks as metamorphic, igneous, or sedimentary by the processes of their formation.

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Plate tectonics was moved to Grade 7.

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### Plate Tectonics

**6.10.D** Describe how plate tectonics causes major geological events such as ocean basin formation, earthquakes, volcanic eruptions, and mountain building.

Plate tectonics was moved to Grade 7.

**6.11.A** Describe the physical properties, locations, and movements of the Sun, planets, moons, meteors, asteroids, and comets.

Movements of objects in the solar system was moved to Grade 7.

### Earth and Space

**Science.6.11** Earth and space. The student understands how resources are managed. The student is expected to:

**6.7** Earth and space. The student knows that some of Earth's energy resources are available on a daily, perpetual basis, while others can be consumed over a relatively short period of time. Some energy resources, once depleted, are essentially irreversible. The student is expected to:

- The advantages and disadvantages of energy resources were moved to Grade 4.

### Science.6.11.A

**Research and describe why resource management is important in reducing global waste, water, soil, and energy utilization.**

**6.7.A** Research and discuss the advantages and disadvantages of using solar and natural gas resources, wind, hydropower, geothermal, and solar resources.

The advantages and disadvantages of energy resources were moved to Grade 4.

### Science.6.11.B

**Explain how conservation, increased efficiency, and technology can help manage water, soil, and energy resources.**

**6.1.B** Describe appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.

### Science.6.12

**Organisms and environments. The student knows that interdependence occurs between living systems and the environment. The student is expected to:**

**6.12.A** Describe biotic and abiotic parts of an ecosystem in which organisms interact.

The concept of relationships is now introduced in Grade 6. It is reinforced and expanded on in Biology.

### Science.6.12.A

**Research and describe examples of predatory, competitive, and symbiotic relationships between organisms, including mutualism, parasitism, and commensalism.**

Bio.12.A Investigate relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms.

### Science.6.12.B

**Describe the hierarchical organization of organism, population, and community within an ecosystem.**

**6.12.F** Diagram the hierarchical organization within an ecosystem, including organism, population, community, and ecosystem.

The concept of classification was moved to Grade 8.

### Science.6.12.C

**Describe the historical development of cell theory and explain how organisms are composed of one or more cells.**

**6.12.A** Understand that all organisms are composed of one or more cells;

The concept of cell theory was moved in from Grade 7.

### Science.6.12.D

**Identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic; and**

**6.12.B** Recognize the components of cell theory.

The concept of classification was moved to Grade 8.

**6.12.E** Recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic;

The concept of domains has been deleted from middle school.

### Science.6.12.C

**Describe how variations within a population can be an advantage or disadvantage to the survival of a population as environments change.**

**7.11.B** Explain variation within a population concepts by comparing external features, behaviors, or morphology of organisms that enhances their survival such as migration, hibernation, or storage of fat in a hulk.

The concept of variations was moved in from Grade 7.

**6.12.C** Recognize that the broadest taxonomic classification of living organisms is divided into currently recognized domains.

### Science.6.13

**Describe the functional structure and variations in organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic; and**

**6.12.D** Identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction that further classify them in the currently recognized kingdom;

The concept of classification was moved to Grade 8.

**6.12.B** Describe the historical development of cell theory and explain how organisms are composed of one or more cells;

The concept of cell theory was moved in from Grade 7.

### Science.6.13.B

**Identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic; and**

**6.12.D** Identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction that further classify them in the currently recognized kingdom;

The concept of classification was moved to Grade 8.

**6.12.B** Recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic;

The concept of classification was moved to Grade 8.

### Science.6.13.C

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The concept of variations was moved in from Grade 7.

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### Key

- Blue double underline: indicates content new to the grade level
- Orange strike-through: indicates content was deleted