Middle School Grade 7 Science Tutorials offer targeted instruction, practice, and review designed to help students develop scientific literacy, deepen conceptual understanding, and apply scientific practices. Students explore concepts such as the classification and conservation of matter, organization in living systems, heredity and variation of traits, and interactions of living systems and the environment.

Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By continually honing their ability to apply knowledge in real-world scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students as they explore the nature of science through focused content, interactive mini investigations, multi-modal representations, and personalized feedback. The Review It offers a high-impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

These Tutorials are built to the Next Generation Science Standards for middle school science.

Unit 1: Nature of Science

- **WHAT IS SCIENCE?**
  - 7.S.1A.4.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to support hypotheses, explanations, claims, or designs.
  - 7.S.1A.8.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to evaluate hypotheses, explanations, claims, or designs or

- 7.S.1A.1.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Ask questions to generate hypotheses for scientific investigations,
- 7.S.1A.3.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: formulate scientific questions and testable hypotheses,
- 7.S.1A.1.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Ask questions to refine models, explanations, or designs, or

- **TYPES OF INVESTIGATIONS**
  - 7.S.1A.1.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Ask questions to generate hypotheses for scientific investigations,
  - 7.S.1A.3.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: formulate scientific questions and testable hypotheses,
  - 7.S.1A.4.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to reveal patterns and construct meaning or

- 7.S.1A.4.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to support hypotheses, explanations, claims, or designs.
- 7.S.1A.1.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Ask questions to extend the results of investigations or challenge claims.
- 7.S.1A.3.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: identify materials, procedures, and variables,
- 7.S.1A.3.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: select and use appropriate tools or instruments to collect qualitative and quantitative data, and

- **USING MODELS**
  - 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
  - 7.S.1A.5.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to express relationships between variables for models and investigations, or

- 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,
- 7.S.1A.6.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using predictions based on observations and measurements, or
- 7.S.1A.8.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to develop models,
- 7.S.1A.1.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Ask questions to refine models, explanations, or designs, or
- 7.S.1A.8.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to evaluate hypotheses, explanations, claims, or designs or

Unit 2: Measurement and Data

- **TOOLS AND MEASUREMENT**
  - 7.S.1A.3.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: select and use appropriate tools or instruments to collect qualitative and quantitative data, and

- 7.S.1A.5.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to use and manipulate appropriate metric units,
- 7.S.1A.5.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to collect and analyze data,
- 7.P.2B.2: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Use mathematical and computational thinking to describe the relationship between the mass, volume, and density of a given substance.
- 7.S.1A.3.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: record and represent data in an appropriate form. Use appropriate safety procedures.

- **DISPLAYING AND INTERPRETING DATA**
  - 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
  - 7.S.1A.3.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: select and use appropriate tools or instruments to collect qualitative and quantitative data, and

- 7.S.1A.3.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: record and represent data in an appropriate form. Use appropriate safety procedures.
- 7.S.1A.4.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to reveal patterns and construct meaning or
- 7.S.1A.5.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to collect and analyze data,
- 7.S.1A.5.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to express relationships between variables for models and investigations, or
- 7.S.1A.5.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to use grade-level appropriate statistics to analyze data.
- 7.S.1A.7: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.

Unit 3: Nature of Matter

- **WHAT IS MATTER?**

- 7.S.1A.7: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.
- 7.P.2A.3: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds. Analyze and interpret data to describe and classify matter as pure substances (elements or compounds) or mixtures (heterogeneous or homogeneous) based on composition.
- 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
- 7.S.1A.6.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using data communicated in graphs, tables, or diagrams.
- 7.P.2A.1: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds. Develop and use simple atomic models to illustrate the components of elements (including the relative position and charge of protons, neutrons, and electrons).

- **ATOMIC STRUCTURE**
  - 7.S.1A.1.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Ask questions to refine models, explanations, or designs, or

- 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
- 7.S.1A.8.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to develop models,
- 7.P.2A.1: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds. Develop and use simple atomic models to illustrate the components of elements (including the relative position and charge of protons, neutrons, and electrons).
- 7.P.2A.2: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds. Obtain and use information about elements (including chemical symbol, atomic number, atomic mass, and group or family) to describe the organization of the periodic table.

- **ELEMENTS AND THE PERIODIC TABLE**
  - 7.P.2A.2: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds. Obtain and use information about elements (including chemical symbol, atomic number, atomic mass, and group or family) to describe the organization of the periodic table.
  - 7.S.1A.4.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Analyze and interpret data

from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to reveal patterns and construct meaning or

- 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,
- 7.P.2A.4: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds. Construct explanations for how compounds are classified as ionic (metal bonded to nonmetal) or covalent (nonmetals bonded together) using chemical formulas.

Unit 4: Describing Matter

- **PHYSICAL AND CHEMICAL PROPERTIES**
  - 7.P.2B.2: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Use mathematical and computational thinking to describe the relationship between the mass, volume, and density of a given substance.
  - 7.P.2B.1: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Analyze and interpret data to describe substances using physical properties (including state, boiling/melting point, density, conductivity, color, hardness, and magnetic properties) and chemical properties (the ability to burn or rust).
  - 7.S.1A.5.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to collect and analyze data,

- 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,
- 7.P.2B.3: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Analyze and interpret data to compare the physical properties, chemical properties (neutralization to form a salt, reaction with metals), and pH of various solutions and classify solutions as acids or bases.

- **SOLIDS, LIQUIDS, AND GASES**
  - 7.P.2B.1: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Analyze and interpret data to describe substances using physical properties (including state, boiling/melting point, density, conductivity, color, hardness, and magnetic properties) and chemical properties (the ability to burn or rust).
  - 7.P.2B.4: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Plan and conduct controlled scientific investigations to answer questions about how physical and chemical changes affect the properties of different substances.
- **MIXTURES OF MATTER**
  - 7.S.1A.5.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to collect and analyze data,
  - 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science

content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,

- 7.P.2A.3: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds. Analyze and interpret data to describe and classify matter as pure substances (elements or compounds) or mixtures (heterogeneous or homogeneous) based on composition.
- 7.S.1A.4.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to reveal patterns and construct meaning or
- 7.S.1A.5.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Use mathematical and computational thinking to express relationships between variables for models and investigations, or
- 7.S.1A.6.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using predictions based on observations and measurements, or
- 7.S.1A.7: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.
- 7.S.1A.8.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts,

develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to explain or describe phenomena,

Unit 5: Changes in Matter

- **HOW CAN MATTER CHANGE?**
  - 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,
  - 7.S.1A.6.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using conclusions from scientific investigations,
  - 7.S.1A.6.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using predictions based on observations and measurements, or
  - 7.S.1A.6.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using data communicated in graphs, tables, or diagrams.
  - 7.S.1A.7: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.
  - 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in

science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,

- 7.S.1A.8.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to explain or describe phenomena,
- 7.P.2B.3: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Analyze and interpret data to compare the physical properties, chemical properties (neutralization to form a salt, reaction with metals), and pH of various solutions and classify solutions as acids or bases.
- 7.P.2B.4: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Plan and conduct controlled scientific investigations to answer questions about how physical and chemical changes affect the properties of different substances.

- **CHANGES OF STATE**
  - 7.S.1A.6.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using data communicated in graphs, tables, or diagrams.
  - 7.S.1A.7: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.
  - 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts,

develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,

- 7.S.1A.6.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using predictions based on observations and measurements, or
- 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,
- 7.S.1A.8.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to explain or describe phenomena,
- 7.P.2B.4: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Plan and conduct controlled scientific investigations to answer questions about how physical and chemical changes affect the properties of different substances.

- **CHEMICAL EQUATIONS**
  - 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,
  - 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in

science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,

- 7.S.1A.8.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to explain or describe phenomena,
- 7.S.1A.8.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to evaluate hypotheses, explanations, claims, or designs or
- 7.P.2B.5: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Develop and use models to explain how chemical reactions are supported by the law of conservation of matter.

Unit 6: Earth's Matter

- **MINERALS**
  - 7.S.1A.6.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using conclusions from scientific investigations,
  - 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,
  - 7.P.2A.3: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can

be used to describe compounds. Analyze and interpret data to describe and classify matter as pure substances (elements or compounds) or mixtures (heterogeneous or homogeneous) based on composition.

- 7.P.2B.1: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Analyze and interpret data to describe substances using physical properties (including state, boiling/melting point, density, conductivity, color, hardness, and magnetic properties) and chemical properties (the ability to burn or rust).
- 7.P.2B.2: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Use mathematical and computational thinking to describe the relationship between the mass, volume, and density of a given substance.

- **SOIL**
  - 7.EC.5A.2: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Construct explanations of how soil quality (including composition, texture, particle size, permeability, and pH) affects the characteristics of an ecosystem using evidence from soil profiles.
  - 7.S.1A.6.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using conclusions from scientific investigations,
  - 7.S.1A.6.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using data communicated in graphs, tables, or diagrams.

- 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,

Unit 7: Movement of Matter Through Ecosystems

- **CHARACTERISTICS OF ECOSYSTEMS**
  - 7.EC.5A.1: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Develop and use models to describe the characteristics of the levels of organization within ecosystems (including species, populations, communities, ecosystems, and biomes).
  - 7.L.3A.4: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Construct scientific arguments to support claims that bacteria are both helpful and harmful to other organisms and the environment.
  - 7.EC.5A.2: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Construct explanations of how soil quality (including composition, texture, particle size, permeability, and pH) affects the characteristics of an ecosystem using evidence from soil profiles.
- **INTERACTIONS IN ECOSYSTEMS**
  - 7.L.3A.4: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and

reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Construct scientific arguments to support claims that bacteria are both helpful and harmful to other organisms and the environment.

- 7.EC.5B.1: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. Organisms in all ecosystems interact with and depend up on each other. Organisms with similar needs compete for limited resources. Food webs and energy pyramids are models that demonstrate how energy is transferred within an ecosystem. Develop and use models to explain how organisms interact in a competitive or mutually beneficial relationship for food, shelter, or space (including competition, mutualism, commensalism, parasitism, and predator-prey relationships).
- 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
- 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,
- 7.EC.5A.3: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Analyze and interpret data to predict changes in the number of organisms within a population when certain changes occur to the physical environment (such as changes due to natural hazards or limiting factors).
- 7.S.1A.6.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using data communicated in graphs, tables, or diagrams.
- 7.EC.5B.2: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. Organisms in all ecosystems interact with and depend up on each other.

Organisms with similar needs compete for limited resources. Food webs and energy pyramids are models that demonstrate how energy is transferred within an ecosystem. Develop and use models (food webs and energy pyramids) to exemplify how the transfer of energy in an ecosystem supports the concept that energy is conserved.

Unit 8: Changing Ecosystems

- **SUCCESSION AND ECOSYSTEM STABILITY**
  - 7.EC.5A.2: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Construct explanations of how soil quality (including composition, texture, particle size, permeability, and pH) affects the characteristics of an ecosystem using evidence from soil profiles.
  - 7.EC.5B.4: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. Organisms in all ecosystems interact with and depend up on each other. Organisms with similar needs compete for limited resources. Food webs and energy pyramids are models that demonstrate how energy is transferred within an ecosystem. Define problems caused by the introduction of a new species in an environment and design devices or solutions to minimize the impact(s) to the balance of an ecosystem.
  - 7.EC.5B.3: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. Organisms in all ecosystems interact with and depend up on each other. Organisms with similar needs compete for limited resources. Food webs and energy pyramids are models that demonstrate how energy is transferred within an ecosystem. Analyze and interpret data to predict how changes in the number of organisms of one species affects the balance of an ecosystem.
  - 7.EC.5A.3: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Analyze and interpret data to predict changes in the number of organisms within a population when certain changes occur to the physical environment (such as changes due to natural hazards or limiting factors).
- **IMPACTS OF HUMANS**
  - 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts,

develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,

- 7.S.1A.3.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: select and use appropriate tools or instruments to collect qualitative and quantitative data, and
- 7.S.1A.6.4: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using data communicated in graphs, tables, or diagrams.
- 7.P.2B.3: Physical Science: Classification and Conservation of Matter The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes. Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction. Analyze and interpret data to compare the physical properties, chemical properties (neutralization to form a salt, reaction with metals), and pH of various solutions and classify solutions as acids or bases.
- 7.EC.5A.2: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Construct explanations of how soil quality (including composition, texture, particle size, permeability, and pH) affects the characteristics of an ecosystem using evidence from soil profiles.
- 7.S.1A.1.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Ask questions to refine models, explanations, or designs, or
- 7.S.1A.4.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts,

develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to support hypotheses, explanations, claims, or designs.

- 7.S.1B.1.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. Technology is any modification to the natural world created to fulfill the wants and needs of humans. The engineering design process involves a series of iterative steps used to solve a problem and often leads to the development of a new or improved technology. Construct devices or design solutions using scientific knowledge to solve specific problems or needs: ask questions about the criteria and constraints of the device or solutions,
- 7.S.1B.1.3: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. Technology is any modification to the natural world created to fulfill the wants and needs of humans. The engineering design process involves a series of iterative steps used to solve a problem and often leads to the development of a new or improved technology. Construct devices or design solutions using scientific knowledge to solve specific problems or needs: generate and communicate ideas for possible devices or solutions,
- 7.EC.5A.3: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations Analyze and interpret data to predict changes in the number of organisms within a population when certain changes occur to the physical environment (such as changes due to natural hazards or limiting factors).
- 7.EC.5B.3: Ecology: Interactions of Living Systems and the Environment The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments. Organisms in all ecosystems interact with and depend up on each other. Organisms with similar needs compete for limited resources. Food webs and energy pyramids are models that demonstrate how energy is transferred within an ecosystem. Analyze and interpret data to predict how changes in the number of organisms of one species affects the balance of an ecosystem.

Unit 9: Cells and Diversity of Life

- **CELL STRUCTURE**
  - 7.S.1A.1.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in

science in ways that are similar to those used by scientists and engineers. Ask questions to refine models, explanations, or designs, or

- 7.L.3A.1.1: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Obtain and communicate information to support claims that organisms are made of one or more cells,
- 7.L.3A.1.2: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Obtain and communicate information to support claims that cells are the basic unit of structure and function of organisms, and
- 7.L.3A.1.3: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Obtain and communicate information to support claims that cells come only from existing cells.
- 7.L.3A.2: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Analyze and interpret data from observations to describe different types of cells and classify cells as plant, animal, protist, or bacteria.

- 7.L.3A.3: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Develop and use models to explain how the relevant structures within cells (including cytoplasm, cell membrane, cell wall, nucleus, mitochondria, chloroplasts, lysosomes, and vacuoles) function to support the life of plant, animal, and bacterial cells.
- 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,

- **DOMAINS AND KINGDOMS OF LIFE**
  - 7.L.3A.2: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Analyze and interpret data from observations to describe different types of cells and classify cells as plant, animal, protist, or bacteria.
  - 7.L.3B.1: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Multicellular organisms (including humans) are complex systems with specialized cells that perform specific functions. Organs and organ systems are composed of cells that function to serve the needs of cells which in turn serve the needs of the organism. Develop and use models to explain how the structural organizations within multicellular organisms function to serve the needs of the organism.

Unit 10: Cell Processes

- **CELL NUTRITION AND TRANSPORT**
  - 7.L.3A.3: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special

structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Develop and use models to explain how the relevant structures within cells (including cytoplasm, cell membrane, cell wall, nucleus, mitochondria, chloroplasts, lysosomes, and vacuoles) function to support the life of plant, animal, and bacterial cells.

- 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
- 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,
- 7.S.1A.6.2: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using conclusions from scientific investigations,
- 7.S.1A.8.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Obtain and evaluate scientific information to answer questions,

- **CELL GROWTH AND REPRODUCTION**
  - 7.L.3A.1.3: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Obtain and communicate information to support claims that cells come only from existing cells.

Unit 11: Multicellular Systems

- **SPECIALIZED CELLS AND TISSUES**
  - 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
  - 7.L.3B.1: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Multicellular organisms (including humans) are complex systems with specialized cells that perform specific functions. Organs and organ systems are composed of cells that function to serve the needs of cells which in turn serve the needs of the organism. Develop and use models to explain how the structural organizations within multicellular organisms function to serve the needs of the organism.
- **ORGANS AND ORGAN SYSTEMS**
  - 7.L.3B.1: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Multicellular organisms (including humans) are complex systems with specialized cells that perform specific functions. Organs and organ systems are composed of cells that function to serve the needs of cells which in turn serve the needs of the organism. Develop and use models to explain how the structural organizations within multicellular organisms function to serve the needs of the organism.

Unit 12: The Human Body

- **HUMAN ORGAN SYSTEMS**
  - 7.L.3B.2: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Multicellular organisms (including humans) are complex systems with specialized cells that perform specific functions. Organs and organ systems are composed of cells that function to serve the needs of cells which in turn serve the needs of the organism. Construct explanations for how systems in the human body (including circulatory, respiratory, digestive, excretory, nervous, and musculoskeletal systems) work together to support the essential life functions of the body.
  - 7.L.3B.1: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Multicellular organisms (including humans) are complex systems with specialized cells that perform specific functions. Organs and organ systems are composed of cells that function to serve the needs of cells which in turn serve the needs of the organism. Develop and use models to explain how the structural organizations within multicellular organisms function to serve the needs of the organism.
- **DISEASE AND HUMAN HEALTH**
  - 7.L.3A.4: Life Science: Organization in Living Systems The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life. Cells are the

most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move. Construct scientific arguments to support claims that bacteria are both helpful and harmful to other organisms and the environment.

Unit 13: Genetics

- **INHERITANCE**
  - 7.L.4A.1: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Obtain and communicate information about the relationship between genes and chromosomes to construct explanations of their relationship to inherited characteristics.
  - 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
  - 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,
  - 7.L.4A.2: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Construct explanations for how genetic information is transferred from parent to offspring in organisms that reproduce sexually.

- 7.L.4A.2: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Construct explanations for how genetic information is transferred from parent to offspring in organisms that reproduce sexually.
- 7.L.4A.3: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Develop and use models (Punnett squares) to describe and predict patterns of the inheritance of single genetic traits from parent to offspring (including dominant and recessive traits, incomplete dominance, and codominance).
- 7.L.4A.3: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Develop and use models (Punnett squares) to describe and predict patterns of the inheritance of single genetic traits from parent to offspring (including dominant and recessive traits, incomplete dominance, and codominance).
- 7.L.4A.4: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Use mathematical and computational thinking to predict the probability of phenotypes and genotypes based on patterns of inheritance.

- **GENES AND DNA**
  - 7.L.4A.1: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how

environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Obtain and communicate information about the relationship between genes and chromosomes to construct explanations of their relationship to inherited characteristics.

- 7.S.1A.2.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Develop, use, and refine models to understand or represent phenomena, processes, and relationships,
- 7.S.1A.6.1: Science and Engineering Practices The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content. The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers. Construct explanations of phenomena using primary or secondary scientific evidence and models,
- 7.L.4A.5: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Construct scientific arguments using evidence to support claims for how changes in genes (mutations) may have beneficial, harmful, or neutral effects on organisms.

- **BIOTECHNOLOGY**
  - 7.L.4A.6: Life Science: HeredityInheritance and Variation of Traits The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information. Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information. Construct scientific arguments using evidence to support claims concerning the advantages and disadvantages of the use of technology (such as selective breeding, genetic engineering, or biomedical research) in influencing the transfer of genetic information.