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Refer to the Getting Started Guide for instructions on how to manually navigate to a citation.

| Benchmark Code | Benchmark | **LESSONS WHERE STANDARD/BENCHMARK IS DIRECTLY ADDRESSED IN MAJOR TOOL (MOST IN-DEPTH COVERAGE LISTED FIRST)**<br>(Include the student edition and teacher edition with the page numbers of lesson, a link to lesson, or other identifier for easy lookup by reviewers.) |
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| PUBLISHER'S NOTE AND INSTRUCTIONS:<br>Teacher logins can see both the teacher and student material. Therefore, a citation of “Unit X, Lesson Y, Activity Z” is good for **both** student material (lesson text, activity instructions) and teacher material. | | |
| SC.6.E.6.1 | Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition. | This standard is addressed in the Weather Patterns units. For example:<br>● In Lesson 1.5, Activity 4, students view the video entitled Understanding Weathering and discuss how precipitation can alter the geosphere.<br>● In Lesson 2.5, Activity 4, students read the article “An Astronaut’s View of Florida” which describes how weathering, erosion, and deposition have shaped the Earth’s surface in Florida. |
| SC.6.E.6.2 | Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida. | This standard is fully addressed in the Weather Patterns unit. In Lesson 2.5, Activity 4, students read the article “An Astronaut’s View of Florida” which describes how weathering, erosion, and deposition have shaped the Earth’s surface in Florida. |

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| SC.6.E.7.1 | Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through Earth's system. | This standard is addressed in the Weather Patterns unit. In Lesson 1.6, Activity 4, students read “Death Valley: Three Reasons Why It's So Hot”, an article which describes how radiation, conduction, and convection all contribute to Death Valley’s high temperatures. |
| SC.6.E.7.2 | Investigate and apply how the cycling of water between the atmosphere and hydrosphere has an effect on weather patterns and climate. | This standard is addressed throughout the Weather Patterns unit. For example:<br>● In Lesson 1.3, Activities 2 and 4, students conduct an experiment and make observations of condensation.<br>● In Lesson 1.2, Activity 3 students investigate the role of evaporation in leading to precipitation.<br>● In Lesson 1.3, Activity 3 and Lesson 1.5, Activity 3, students investigate the role of condensation in producing clouds and precipitation.<br>● In Lesson 1.3, Activity 5, students read “What Makes Water Move” about the role of gravity in the water cycle.<br>● In Lesson 2.2, Activities 2 and 3, and Lesson 2.3, Activity 2, students read and discuss “Disaster in California!”, and article which describes the cycling of water between the atmosphere and hydrosphere in California during a period of extreme weather. |
| SC.6.E.7.3 | Describe how global patterns such as the jet stream and ocean currents influence local weather in measurable terms such as temperature, air pressure, wind direction and speed, and humidity and precipitation. | This standard is addressed throughout the Ocean, Atmosphere, and Climate unit. For example:<br>● In Lesson 1.2, Activity 4, students read “Effects of El Niño Around the World” an article describing effects on local weather from this disruption to global patterns.<br>● In Lesson 2.1, Activities 2 and 3, and in Lesson 2.2, Activity 2, students read “The Ocean in Motion”, an article which describes how ocean currents move warm and cold water around the globe, influencing regional climates.<br>● In Lesson 2.3, Activity 2, students conduct an experiment about the transfer of energy between air and water at different temperatures and discuss how this relates to cold and warm ocean currents’ effect on regional climates.<br>● In Lesson 2.3, Activity 3, students use a digital simulation to compare energy transfer and air temperatures at two locations at the same latitude, one near a cold ocean current and one near a warm ocean current.<br>● In Lesson 3.1, Activities 3 and 4, and Lesson 3.2, Activity 2, students read and discuss “The Gulf Stream: A Current That Helped Win a War” |

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| | | an article which describes how prevailing winds affect ocean currents (which in turn affect regional climates).<br>● In Lesson 3.3, Activity 3, students use a digital simulation to investigate the effect of changing prevailing winds on ocean currents and regional climates.<br>● In Lesson 3.4, Activities 4 and 6, students write an explanation of how the El Niño phenomenon causes changes in New Zealand's weather, a question they have investigated over the course of Chapter 1,2, and 3 of the unit. |
| SC.6.E.7.4 | Differentiate and show interactions among the geosphere, hydrosphere, cryosphere, atmosphere, and biosphere. | This standard is addressed in several units. For example:<br>● In Ocean, Atmosphere, and Climate, Lesson 3.4, Activity 5, students analyze a set of Earth Sphere Interaction Cards. Each card describes a scenario, and students discuss and identify which of Earth's spheres (geosphere, hydrosphere, cryosphere, atmosphere, and biosphere) are involved in the scenarios (one of which is the El Niño phenomenon).<br>● In Weather Patterns, Lesson 1.5, Activity 4, students discuss ways that precipitation can affect various of Earth's spheres. |
| SC.6.E.7.5 | Explain how energy provided by the sun influences global patterns of atmospheric movement and the temperature differences between air, water, and land. | This standard is addressed throughout the Ocean, Atmosphere, and Climate unit. For example:<br>● In Lesson 1.3, students discover that energy from sunlight is first transferred to land or water on Earth's surface before being transferred to the air, through an experiment (Activities 2 and 4) and use of a digital simulation (Activity 3)<br>● In Lesson 1.4, Activity 2, students examine maps showing solar energy and average air temperature around the world to conclude that the closer a location is to the equator, the more energy from sunlight reaches it, and the warmer its air temperatures<br>● In Lesson 2.4, Activity 5 (click NEXT to see part 2 of 2 of this activity), students read "How the Ocean Keeps Climates Stable" an article which compares the climates of Seattle and Minneapolis and explains how the ocean works as a heat sink to moderate air temperatures.<br>● In Lesson 3.2, Activity 4 (click NEXT to see part 2 of 2 of this activity), students read "What Causes Prevailing Winds?" an article that explains how temperature differences cause wind. |
| SC.6.E.7.6 | Differentiate between weather and climate. | This standard is addressed in the Ocean, Atmosphere, and Climate unit in Lesson 1.2. Students view a short documentary video called "Chasing El Niño" |

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| | | (see Activity titled “Chasing El Niño”) about climate scientists, then in Activity 2 they discuss the definition of the term climate in relation to the term weather. |
| SC.6.E.7.7 | Investigate how natural disasters have affected human life in Florida. | This standard is addressed in the Weather Patterns unit in Lesson 3.2, Activity 4. Each student reads a short description of one natural disaster in Florida’s history. |
| SC.6.E.7.8 | Describe ways human beings protect themselves from hazardous weather and sun exposure. | This standard is addressed in the Weather Patterns unit. For example:<br>● In Lesson 3.2, Activity 4, after reading about natural disasters in Florida’s history, and the class uses what they read to discuss possible ways of protecting against natural disasters. The class also discusses the danger of sun exposure and ways of protecting against it. |
| SC.6.E.7.9 | Describe how the composition and structure of the atmosphere protects life and insulates the planet. | This standard is addressed in the Ocean, Atmosphere, and Climate unit in Lesson 1.4, Activity 4. Students read an article titled “Earth's Atmosphere: An Invisible Shield” which describes several ways that Earth’s atmosphere protects life on Earth. |
| SC.6.L.14.1 | Describe and identify patterns in the hierarchical organization of organisms from atoms to molecules and cells to tissues to organs to organ systems to organisms. | This standard is addressed in the Microbiome and Metabolism units. In these units, students investigate the relative scales of a variety of organisms (including microorganisms) and cells. For example:<br>In Microbiome:<br>● In Lesson 1.1, Activity 4, students explore the Scale Tool, which visually represents the relative scales of objects and organisms from macroscale to microscopic to molecular and atomic scales.<br>● In Lesson 1.2, Activity 5, students read about how cells are organized into tissues, tissues into organs, and organs into systems in the article “Cells: The Basic Unit of Life” (located in the Amplify Library)<br>In Metabolism:<br>● In Lesson 3.3, Activity 5, students read “The Big Climb: A Story in Large and Small Scale,” an article about the hierarchical organization of organisms. |
| SC.6.L.14.2 | Investigate and explain the components of the scientific theory of cells (cell theory): all organisms are composed of cells (single-celled or multi-cellular), all cells come from pre-existing cells, and | This standard is addressed in the Microbiome unit. For example:<br>● In Lesson 1.2, the Activity titled “Introducing Cells”, students analyze information from a video, How small is a cell?, which introduces the idea that all living things are made of cells. The teacher introduces the concept of cell theory. In that same lesson, in Activity 2, students analyze information about different cell types, including those that make |

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| | cells are the basic unit of life. | up unicellular organisms and those that make up organs in the human body.<br>● In Lesson 2.1,, Activity 3, students read the article “The Human Microbiome” to obtain information about unicellular and multicellular organisms.<br>● Students draw conclusions about a variety of single-celled organisms, for example, reading about single-celled bacteria in Lesson 2.6, Activity 3, as they investigate the human microbiome. |
| SC.6.L.14.3 | Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing. | This standard is addressed across multiple units in the Comprehensive Science 1 Course. For example:<br>● In Metabolism Lesson 2.1, the Activity titled “Playing Body System Model Video”, students are introduced to the concept of homeostasis and discuss how the villi and alveoli play a role in maintaining homeostasis.<br>● In Metabolism Lesson 1.3, Activity 2, students read an article “Molecules Cells Need” to construct an understanding of how cells use oxygen, amino acids, and glucose.<br>● In Lesson 1.2, Activity 5 of the unit Microbiome, students read about how cells make up all living things and undergo processes to take in food and get energy in the article “Cells: The Basic Unit of Life” (located in the Amplify Library) |
| SC.6.L.14.4 | Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles. | This standard is addressed across multiple units in the Comprehensive Science 1 Course. For example:<br>● In Lesson 1.2, Activity 5 of the unit Microbiome, students read about the organelles of plant and animal cells in the article “Cells: The Basic Unit of Life” (located in the Amplify Library). The article includes descriptions of the structure and function of the cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles; and contrasts plant cells with animal cells.<br>● In Lesson 2.7, Activity 4 of the unit Microbiome, students read the article “Tree of Life: Classifying Organisms” which includes descriptions and images of the cell wall, cell membrane, nucleus, cytoplasm, and mitochondria; and includes a table comparing and contrasting the organelles of plant and animal cells.<br>● In the Metabolism unit, students investigate the role of the mitochondria and cell membrane in cellular respiration; they read an article about cellular respiration (Lesson 3.2, Activity 3) and observe and analyze |

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| | | information from the Metabolism sim that models the process at the cellular level (Lesson 3.2, Activity 4). |
| SC.6.L.14.5 | Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis. | This standard is addressed in the Metabolism unit. Investigations in the unit support students to learn and describe how starches and proteins are broken down into glucose and amino acids in the digestive system, while oxygen comes in through the respiratory system, and the circulatory system transports these molecules to the cells. For example:<br>● In Lesson 2.1, Activity 3, students engage in a classroom-sized model of the body to develop an understanding of how body systems work together to get necessary molecules to cells. Students are introduced to the three main body systems involved in metabolism: the digestive, respiratory, and circulatory systems.<br>● In Lesson 2.2, Activity 2, students read “Patient Stories,” which provides examples of patients diagnosed with various health conditions that affect the functions of major body systems.<br>● In Lesson 2.4, Activity 2, students use the Metabolism simulation to run tests on a healthy body and on a body with a health condition to investigate the effects of various conditions on body systems.<br>● In Lesson 2.6, Activity 5, students read about other systems of the human body (reproductive, excretory, immune, nervous, and musculoskeletal) |
| SC.6.L.14.6 | Compare and contrast types of infectious agents that may infect the human body, including viruses, bacteria, fungi, and parasites. | This standard is addressed in the Microbiome unit. In Lesson 1.3, Activity 5 in this unit, students read an article titled “Germs Are Not All the Same,” which explores similarities and differences among parasites, fungi, bacteria, and viruses, infectious agents that can cause illness in humans. |
| SC.6.L.15.1 | Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains. | This standard is addressed in the Microbiome unit. In Lesson 2.7, Activity 4 of this unit, students read an article titled “Tree of Life: Classifying Organisms,” which explains how and why scientists classify organisms into three domains (eukarya, bacteria, and archaea). It further explores the subdivision of the domain eukarya into kingdoms (plants, animals, fungi, and protists). |
| SC.6.N.1.1 | Define a problem from the sixth-grade curriculum, use appropriate reference materials to support scientific understanding, plan and | Every unit in Amplify Science is structured around conducting investigations as well as gathering and analyzing evidence from other sources to draw and defend conclusions about scientific principles as well as specific phenomena.<br>For example, in the Magnetic Fields unit, students are investigating what could |

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| | carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions. | have caused a failure in the test of a model of an electromagnetic spacecraft launcher system. They then apply what they have learned to the design of electromagnetic launcher systems for roller coasters.<br>● In Lesson 2.2, students are investigating the question: How can magnets cause objects to have kinetic energy? In Activity 2 students use reference materials (a set of articles about kinetic and potential energy in extreme sports) to gather evidence about where kinetic energy comes from; then in Activity 3, students use physical materials (including magnets) to plan and build systems that can give an object kinetic energy.<br>● In Lesson 4.1, Activity 4, students evaluate evidence from a set of magnet experiments in order to determine whether or not variables were controlled. After identifying which variables were not controlled appropriately, students design their own improved experiments in Lesson 4.2, Activity 2. In Activity 3 and 4 they analyze and discuss the results.<br>● In Lesson 4.3, Activity 3, students engage in a discussion in which they defend their conclusions about the launcher designs. They then produce a written argument in Activity 4.<br>In the Ocean, Atmosphere, and Climate unit, students are investigating what causes Christchurch, New Zealand to have colder air temperatures than normal during El Niño years.<br>● In Lesson 3.3, Activity 3, students make predictions about how a change to wind could affect air temperature, then test their predictions by planning and conducting experiments using the Ocean Atmosphere and Climate simulation, and gathering and analyzing the resulting data.<br>● In Lesson 3.4, Activities 2-6, students analyze a variety of data, then discuss, plan, and write scientific explanations describing their conclusions about the causes of the cold weather in Christchurch. |
| SC.6.N.1.2 | Explain why scientific investigations should be replicable. | This standard is addressed in multiple units. For example:<br>● In the Force and Motion unit, Lesson 1.4, Activity 3, students conduct a hands-on investigation in which they conduct repeated trials in order to collect data on the relationship between force and velocity change.<br>● In the Metabolism unit, Lesson 2.4, Activity 2, and Lesson 3.1, Activity 4, students gain experience with the value of conducting repeated trials in order to support accurate conclusions.<br>● In the Metabolism Engineering Internship, Lesson 6, Activity titled “Retesting the Optimized Recipe” students discuss variability and the |

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| | | importance of repeat testing. |
| SC.6.N.1.3 | Explain the difference between an experiment and other types of scientific investigation, and explain the relative benefits and limitations of each. | This standard is addressed in multiple units, in which students engage in different types of investigations and discuss the evidence gathered. For example:<br>● In the Metabolism Unit, Lesson 2.4, Activity 2, students conduct controlled experiments using the Metabolism simulation. They then discuss the nature of experiments and the distinction between experiments and systematic observations (press NEXT to view part 4 of 4 of this activity).<br>● In the Magnetic Fields unit, Lesson 4.2, Activity 2, students design and conduct a controlled experiment, using the Magnetic Fields simulation, to investigate the factors affecting kinetic energy changes in a system of electromagnets.<br>● In the Force and Motion unit, Lesson 2.1, Activity 2, students conduct a controlled experiment to investigate the relationship between mass, force, and velocity change. Metabolism Unit, Lesson 2.4, Activity 2, students conduct controlled experiments using the Metabolism simulation.<br>● In the Microbiome unit, Lesson 1.3, Activity 3, students conduct a systematic observation of a bacteria culture. |
| SC.6.N.1.4 | Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation. | In every Amplify Science student, there are frequent opportunities for student-to-student talk as students share results of investigations and discuss possible explanations. For example:<br>● In the Magnetic Fields Unit, Lesson 3.1, Activity 2, students plan and conduct an investigation of the question, ““What affects the amount of potential energy stored in the magnetic field when a magnet is moved against a magnetic force?” using the Magnetic Fields simulation. In Activity 3, the teacher leads a class discussion in which students share how they designed their experiments and the evidence they collected.<br>● In the Metabolism Unit, Lesson 3.2, Activity 2, each group of students conducts a systematic observation of a chemical reaction that releases energy. Their observations of the temperature change may vary depending on exactly how they mix the substances. The class discusses in order to make sense of observations and conclusions about energy release. |

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| SC.6.N.1.5 | Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence. | Students are exposed to many different examples of scientists using creativity in their work. For example:<br>● In Force and Motion, Lesson 2.2, Activity 2, students read an article, "Designing Wheelchairs", which describes the creative processes used by an engineer who designs wheelchairs to be used by different kinds of athletes.<br>● In Metabolism, Lesson 2.3, Activity 5, students read an article, "Meet a Scientist Who Grows New Cells", which describes the creative processes used by a scientist who is designing processes to grow new tissues to replace body parts.<br>Students also think creatively themselves as they plan investigations and create explanations. For example:<br>● In the Magnetic Fields Unit, Lesson 3.1, Activity 2, students plan and conduct their own investigation of the question, "What affects the amount of potential energy stored in the magnetic field when a magnet is moved against a magnetic force?" using the Magnetic Fields simulation.<br>● In the Force and Motion Unit, Lesson 1.6, Activity 3, students use creativity as they produce explanations for two possible claims that could both fit the evidence students have about what could have caused an observed change in velocity.<br>● In the Metabolism Unit, Lesson 1.2, Activity 4, students design their own experiments using the Metabolism Simulation, to test the results of different diets on body system outcomes.<br>● In the Weather Patterns Unit, Lesson 4.3, Activity 2, students use creativity to generate and describe explanations for weather damage to a wilderness education center, based on several pieces of evidence. |
| SC.6.N.2.1 | Distinguish science from other activities involving thought. | Amplify Science units provide students with a strong foundational understanding of how scientific knowledge is constructed and how this differs from everyday thinking processes. One illustration of this is the Argumentation Wall, which is introduced in Microbiome, Lesson 2.3, in the Activity titled "Introducing Argumentation". The wall contains visual representations of the goals and structure of scientific arguments, and is added to and referred to across the year. When the Argumentation Wall is introduced, there is explicit discussion of the differences between scientific knowledge and other kinds of knowledge. |
| SC.6.N.2.2 | Explain that scientific knowledge is durable because it is open to change as new evidence or | Across multiple Amplify Science units, students encounter this concept both in their own work and in reading about scientists. For example:<br>● In the Force and Motion unit, students refine their claims about the |

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| | interpretations are encountered. | causes of a space pod docking failure as they receive new evidence. For example, in Lesson 2.1, Activity 1, they receive new evidence and reflect on how this might prompt them to revise their claims.<br>● In the Magnetic Fields unit, in Lesson 4.3, Activity 3, students participate in a Science Seminar discussion in which they present and discuss evidence. Students are encouraged to change their mind in the face of convincing counter evidence.<br>● In Microbiome, students refine their claims about the effects of a fecal transplant as they receive new evidence about their case study patient. These experiences are in Lesson 2.2, Activity 3; 2.3, Activity 3; 2.4, Activity 4; and 2.5, Activity 2.<br>● In Metabolism, Lesson 1.3, Activity 4 and 5, students receive and analyze new evidence about the patient they are diagnosing, and revise their initial claims based on the new evidence.<br>● In the Ocean, Atmosphere, and Climate unit, Lesson 1.5, Activity 3, students analyze new evidence about the amount of energy from the sun and the sea surface temperature near Christchurch New Zealand in normal and El Niño years, that causes students to reject one claim and see the need for more evidence about another. |
| SC.6.N.2.3 | Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals. | Across multiple Amplify Science units, students encounter profiles of scientists of a wide variety of ethnic and racial backgrounds, and of different ages and genders. The profiles highlight a variety of goals, interests and manners of investigating. For example:<br>● In the Magnetic Fields unit, Lesson 1.2, Activity 6, students read an article, “Meet a Scientist Who Studied Magnets”, a profile of and African-American scientist born on a peanut farm in rural Alabama in 1909 who grew up to be one of the nation’s greatest experts on low-temperature magnetism.<br>● In the Force and Motion unit, Lesson 2.2, Activity 2, students read an article, “Designing Wheelchairs”, which features an engineer who was disabled during his military service and now designs wheelchairs to be used by different kinds of athletes.<br>● In the Force and Motion unit, Lesson 1.2, the activity titled “The Missing Seconds Video”, scientists and engineers presented in a fictional introductory video represent gender, age, and ethnic diversity.<br>● In the Magnetic Fields unit, Lesson 1.2, the activity titled “Video: Troubleshooting a Magnetic Launcher”, scientists and engineers presented in a fictional introductory video represent gender, age, and |

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| | | ethnic diversity.<br>● In Metabolism, Lesson 2.3, Activity 5, students read an article, “Meet a Scientist Who Grows New Cells”, which describes the work of Dr. Grace O'Connell, a woman of color who investigates ways to grow new tissues for medical purposes. |
| SC.6.N.3.1 | Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life. | Students are exposed to examples of theories and other forms of scientific knowledge across multiple units. For example, in Microbiome, students are exposed to cell theory. In Lesson 1.2, in the Activity titled “Introducing Cells”, students watch a video called, “How Small is a Cell?” which introduces the idea that all living things are made of cells. Students are introduced to the term cell theory. |
| SC.6.N.3.2 | Recognize and explain that a scientific law is a description of a specific relationship under given conditions in the natural world. Thus, scientific laws are different from societal laws. | This standard is addressed across multiple units. For example:<br>● In Magnetic Fields, Lesson 2.3, Activity 3, students discuss how the Law of Conservation of Energy applies to the magnetic systems they are investigating, and also discuss what a scientific law is and how it is different from a societal law (click NEXT to see part 4 of 4 of this activity to see where this discussion takes place).<br>In addition:<br>● In Force and Motion, students have a number of experiences that support an understanding of the Laws of Motion. For example, in Lesson 1.3, Activity 3, students use the Force and Motion simulation to investigate forces. Students run tests in the simulation to make objects start moving, stop moving, speed up and slow down. Students observe that a force is always required to change the velocity of an object. In Lesson 1.4, Activity 3, students conduct a hands-on investigation in which they conduct repeated trials in order to collect data on the relationship between force and velocity change. |
| SC.6.N.3.3 | Give several examples of scientific laws. | Students are exposed to examples of scientific laws across multiple units. For example, in Magnetic Fields, Lesson 2.3, Activity 3, students discuss how the Law of Conservation of Energy applies to the magnetic systems they are investigating (click NEXT to see part 4 of 4 of this activity to see where this discussion takes place).<br>In addition:<br>● In Force and Motion, students have a number of experiences that |

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| SC.6.N.3.4 | Identify the role of models in the context of the sixth-grade science benchmarks. | Throughout the Amplify Science program, students experience the importance of a wide variety of models to scientific investigation and communication. For example:<br>● In the Magnetic Fields unit, students learn about how magnetic fields lines are used to model magnetic force fields, including in the article "Earth's Geomagnetism", read in Lesson 1.4, Activity 2.<br>● In Lesson 1.2, Activity 2, the Metabolism simulation is introduced as a scientific model and students conduct initial observations and exploration of the sim. In Lesson 2.1, Activity 3, students investigate interactions between body systems using a kinesthetic classroom model. In Lesson 2.3, Activity 3, students use a digital Modeling Tool to create a visual model showing how a particular medical condition affects body systems and molecules in the body.<br>● In the Ocean, Atmosphere, and Climate Unit, in Lesson 1.2, Activity 3, the simulation is introduced as a scientific model and students conduct initial observations and exploration of the sim. In Lesson 2.4, Activity 3, students use a digital Modeling Tool to create a visual model showing how ocean currents affect regional climates. In Lesson 3.2, Activity 3, students use a small container of water as a physical model to investigate how prevailing winds affect ocean current direction and speed. |
| SC.6.P.11.1 | Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa. | This standard is addressed across multiple units in the Comprehensive Science 1 Course. For example:<br>● In the Magnetic Fields unit, Lesson 2.2, Activity 2, students read articles about kinetic and potential energy in extreme sports. Students learn that kinetic energy can be converted into potential energy and vice versa. Students identify how potential energy is converted into kinetic energy for movement in a particular sport.<br>● In the Magnetic Fields unit, Lesson 2.2, Activity 3, students use hands |

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| | | on materials to create three energy systems where potential energy is converted into kinetic energy. Students identify when the system has more potential energy and when it has more kinetic energy.<br>● In Magnetic Fields, Lesson 2.3, Activity 3 (press NEXT to see part 4 of 4), students make an explicit connection between their investigation results and the law of conservation of energy. |
| SC.6.P.12.1 | Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship. | This standard is addressed in the Force and Motion unit:<br>● In Lesson 1.6, Activity 4, Students measure and graph the time it takes a rolling ball to travel a certain distance. Students graph the results for a slow-rolling ball, a ball rolling at medium speed, and a fast-rolling ball. Students interpret and analyze the graphs to find the graphed line is steeper for faster moving objects. |
| SC.6.P.13.1 | Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational. | This standard is addressed across multiple units in the Comprehensive Science 1 Course. For example:<br>● In the Force and Motion unit, Lesson 1.3, Activity 3, students use the Force and Motion simulation to investigate forces. Students run tests in the simulation to make objects start moving, stop moving, speed up and slow down. Students observe that a force is always required to change the velocity of an object.<br>● In the Magnetic Fields unit, Lesson 1.2, Activity 3 and Activity 4, students investigate forces acting at a distance using magnets and the Magnetic Fields simulation. Students gather evidence from both sources to discover that magnetic forces can attract or repel objects at a distance.<br>● In the Magnetic Fields unit, Lesson 1.5, Activity 5, students read the article “Painting with Static Electricity”. The article provides an opportunity for students to learn about electrical fields produced by charged objects and how electrical fields create forces that can act at a distance to move objects. |
| SC.6.P.13.2 | Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are. | This standard is addressed in the Magnetic Fields unit:<br>● In Lesson 3.2, activity 4, Students read the article “Escaping a Black Hole” about the gravitational forces between objects. Students learn that a gravitational force is a pull that acts between all objects and the greater the mass of the objects the greater the force. Students also learn that the gravitational force between two objects depends on how far apart they are: the closer the two objects, the stronger the field between |

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| SC.6.P.13.3 | Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both. | This standard is addressed in the Force and Motion unit. For example:<br>• In Lesson 1.3, Activity 3, students use the Force and Motion simulation to investigate forces. Students run tests in the simulation to make objects start moving, stop moving, speed up and slow down. Students observe that a force is always required to change the velocity of an object. (Press NEXT to see all 4 parts of this activity; students are introduced to the idea of balanced and unbalanced forces in part 4 of 4)<br>• In Lesson 3.2, Activity 2, students investigate the forces in a collision by causing collisions between two balls. Students discover that in a collision the forces on each object are in opposite directions which cause the objects to change speed and/or change direction. |
| LAFS.6.SL.1.1 | Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others ideas and expressing their own clearly. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion. Review the key ideas expressed and demonstrate understanding of multiple | This standard is addressed across multiple units in the Comprehensive Science 1 Course. Most units end with a curricular sequence called the Science Seminar Sequence, which asks students to apply what they have learned to a new context. Students are presented with competing claims and evidence, then prepare for a whole-class discussion of this evidence. The following offer examples of students coming prepared to discuss a specific, content-specific topic:<br>• In Lesson 4.3, Activity 3 of Metabolism, students discuss claims about blood doping, cellular respiration and high altitude training and use evidence that they have examined during the previous two lessons during the discussion.<br>• In Lesson 2.6, Activity 4 of the Microbiome unit, students discuss the relative strength of various pieces of evidence, using a tool called the Evidence Gradient. This tool helps students to share their thinking aloud in a collegial way, and provides them with a specific goal to accomplish during discussion -- to try to decide together where on the Gradient to place each piece of evidence. In addition, students are supported in this activity by the inclusion of a set of Argumentation Sentence Starters, which can be referenced in support of productive argumentation.<br>• In Lesson 2.4, Activity 2 of the Metabolism unit, students work together and use the Metabolism simulation to respond to questions about different conditions that a body might have that affect its ability to get either oxygen, glucose or protein to the cells. Students collect and discuss data in order to draw conclusions from the tests they run in the |

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| | perspectives through reflection and paraphrasing. | simulation. |
| LAFS.6.SL.1.2 | Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study. | This standard is addressed across multiple units in the Comprehensive Science 1 Course. For example:<br>● In Lesson 2.3, Activity 2 of the Metabolism unit, students re-read an article about one of four conditions (anemia, asthma, diabetes, EPI) that they read about in a previous lesson. They then create models of this condition with a partner in Activity 3, discussing what they learned from the reading as they work. Finally, in Activity 4, students create models of the condition in the Metabolism simulation, discussing and annotating their sim representations before turning them in. |
| LAFS.6.SL.1.3 | Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not. | This standard is addressed across multiple units in the Comprehensive Science 1 Course. Most units end with a curricular sequence called the Science Seminar Sequence. This 3-day series of lessons asks students to use content derived throughout the unit and apply it to understanding a new context. Students are presented with competing claims and evidence, then prepare for a whole-class discussion of this evidence. The following offer examples of students discussing claims and evidence and using reasoning:<br>● In Lesson 4.3, Activity 3 of Metabolism, students discuss claims about blood doping, cellular respiration and high altitude training and use evidence to determine whether there is more convincing evidence to support the claim that an athlete blood-doped, or that he trained at high altitude -- or if another claim might explain this athlete's performance.<br>● In Lesson 4.3, Activity 2 of Weather Patterns students, in a whole-class group format, discuss claims about what kind of rainstorm (or rainstorms) destroyed a remote environmental center (one large storm or several medium ones), and use evidence and reasoning to determine which scenario best explains what happened there. During the discussion, students evaluate which evidence is relevant and irrelevant to each claim and evaluate the soundness of the reasoning that each participant offers. |
| LAFS.6.SL.2.4 | Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate | This standard is addressed across multiple units in the Comprehensive Science 1 Course. Most units end with a curricular sequence called the Science Seminar Sequence. The science seminar itself provides students with opportunities to discuss and sequence ideas logically, use pertinent descriptions, facts and details to accentuate main ideas or themes and use appropriate eye contact, |

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| | eye contact, adequate volume, and clear pronunciation. | adequate volume and clear pronunciation so they can communicate with their peers. For example:<br>● In Lesson 4.3, Activity 3 of Metabolism, students discuss claims about blood doping, cellular respiration and high altitude training and hold a student-led discussion about these content-driven topics.<br>● In Lesson 4.3, in the Activity titled 'Introducing the Science Seminar' from the Weather Patterns unit, the class reviews the important social attributes needed to participate effectively in scientific argumentation. In Activity 2, students discuss claims about what kind of rainstorm (or rainstorms) destroyed a remote environmental center (one large storm or several medium ones). during the whole-class discussion students use evidence that they have examined during the previous two lessons to support their thinking. |
| LAFS.6.SL.2.5 | Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information. | This standard is addressed across multiple units in the Comprehensive Science 1 Course. For example:<br>● In Lesson 4.3, Activity 4 in the Metabolism Unit (see the Teacher Support note titled Instructional Suggestion: Literacy Note: Additional Modalities for Sharing Arguments) students are presented with presentation options for their final argument, including a multimedia presentation or video.<br>● In Lesson 2.4, Activity 2 of the Metabolism unit, students who have already been assigned a body condition to learn about (anemia, asthma, EPI or diabetes) are now responsible for teaching each other about their assigned condition. Students work in pairs with the Metabolism simulation, using provided questions as prompts to help them explain to their partner what is happening in the simulated body. Students use several different displays the simulation has to offer during their presentation to a peer, including a 'working' body that shows molecules moving through it, a function that allows students to use pop-ups to show helpful, explanatory text, and tables that display data after each simulation run, to discuss information and draw conclusions and present their thinking to each other.<br>● In Lesson 4.2 of the Ocean, Atmosphere and Currents unit, Activity 3, students participate in a whole-class Science Seminar discussion. The evidence under discussion comes from several diagrams, maps and other visuals that students have analyzed in Lesson 4.1 and, throughout the discussion in the Science Seminar these visuals are projected so that students can reference and discuss them throughout. |

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| LAFS.68.RST.1.1 | Cite specific textual evidence to support analysis of science and technical texts. | This standard is addressed in every unit of the Comprehensive Science 1 Course. Students read articles multiple times, for different purposes, in order to gather textual evidence to support science ideas. For example:<br>● In Lesson 2.2, Activity 2 of the Force and Motion unit, students read the article, “Designing Wheelchairs.” Students are encouraged to actively read and analyze the text by making annotations, noting questions they have and connections they are making as they read. During Activity 3, students discuss their annotations with a partner, then with the whole class. The reading followed by a text-based discuss helps students to better understand important ideas about force, motion and velocity as they work together to analyze the text.<br>● In Lesson 2.3, Activity 2 of the Metabolism unit, students re-read the same article they read (from a set) during the previous lesson. Each article is about a particular condition (diabetes, asthma, anemia or EPI) that can affect a person’s energy level. Students re-read and gather specific information about their assigned condition that they will share with their peers. They also use this information as evidence to support a diagnosis they make later in the Chapter, about which of the four conditions they believe a patient they are studying has.<br>● In Lesson 2.2, Activity 2 of the Weather Patterns unit, students read the article, “Disaster in California!” Students are encouraged to actively read and analyze the text by making annotations, noting questions they have and connections they are making as they read. During Activity 3, students discuss their annotations with a partner, then with the whole class. The reading coupled with this text-based discussion helps students to better understand important content related to temperature and energy, the relationship between these and how far cloud might rise into the troposphere, and what this means for the size of a storm. |
| LAFS.68.RST.1.2 | Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. | This standard is addressed in every unit of the Comprehensive Science 1 Course. Students read articles multiple times and apply the strategy of summarizing often. In addition, for every ‘second read’ students are asked questions that help them to summarize the important ideas from the text. For example:<br>● In Lesson 2.3, Activity 2 of the Metabolism unit, students re-read the same article they read (from a set) during the previous lesson. Each article is about a particular condition (diabetes, asthma, anemia or EPI) that can affect a person’s energy level. Students re-read so they can fully understand what is happening to the body with their assigned |

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| | | <ul><li>condition, as they prepare to share this information with a small group of their peers.</li><li>In Lesson 1.5, Activity 2 on the Magnetic Fields unit, students re-read a section the same article they read in the previous lesson. The purpose of this second read is to have students fully understand central ideas from the article that pertain to magnetic field lines.</li></ul> |
| LAFS.68.RST.1.3 | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. | This standard is addressed in every unit of the Comprehensive Science 1 Course. For example:<ul><li>In Lesson 3, Activity 4 of the Metabolism Engineering Internship unit, students use a digital data tool to test various recipes. In order to complete the tests, which include gathering and interpreting measurements and data, students must read and follow multistep procedures.</li><li>In Lesson 2.1, Activity 3 of the Metabolism unit, students independently enact a classroom model of the human body and what happens to it under various conditions. In order to do this, they must work together and follow a complicated set of procedures.</li><li>In Lesson 2.3, Activity 3 of the Ocean, Atmosphere and Climate unit, students use the Ocean, Atmosphere and Climate simulation to make observations and collect data about the air temperature in two different locations on Earth: one near a warm current and one near a cold current. Students must follow a multistep procedure in order to collect the necessary data for this activity.</li></ul> |
| LAFS.68.RST.2.4 | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 68 texts and topics. | This standard is addressed in every unit of the Comprehensive Science 1 Course. For example:<ul><li>In Lesson 1.6, Activity 2 of the Magnetic Fields unit, students examine a series of visual representations that support an understanding of how magnets and magnetic fields work. Students must interpret symbols and utilize domain-specific words in order to understand and participate in this activity.</li><li>In Lesson 2.2, Activity 3 of the Microbiome unit, students examine two pie graphs representing the amounts and different kinds of bacteria in a patient's gut over time. Students examine these pie graphs for differences and make inferences about a patient's condition using this data. They then examine subsequent pie graphs in upcoming lessons; students must understand the meaning of the symbols and key terms associated with these graphs in order to comprehend the information on</li></ul> |

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| | | them.<br>● In Lesson 3.2, Activity 3 of the Weather Patterns unit, students read, annotate and analyze evidence cards. Each card contains text and various symbols along with either graphs, maps or tables containing data. Students must carefully read all available information in order to make meaning from these cards. |
| LAFS.68.RST.2.5 | Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic. | This standard is addressed in multiple units. For example:<br>● In the Metabolism unit, Lesson 2.2, Activity 2 (see the Teacher Support tab, note titled "Instructional Suggestion: Literacy Note: Text Structure) students are introduced to the idea of different text structures and discuss the text structure that best applies to the "Patient Stories" articles.<br>● In the Metabolism Engineering Internship unit in Lesson 1, during the activity titled, "Introducing the Futura Workspace and Dossier" for the Metabolism Engineering Internship unit, students learn what a dossier is (a term professionals use for a set of related documents) and learn that as engineering interns, they too will be examining and adding to a dossier. They read different portions of the dossier, and add their own reports to this document, throughout the unit. |
| LAFS.68.RST.2.6 | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text. | This standard is addressed in the Metabolism Engineering Internship unit of the Comprehensive Science 1 Course:<br>● In Lesson 1, during the activity titled, "Introducing the Futura Workspace and Dossier" for the Metabolism Engineering Internship unit, students learn what a dossier is (a term professionals use for a set of related documents) and learn that as engineering interns, they too will be examining and adding to a dossier. They read different portions of the dossier, and add their own reports to this document, throughout the unit. |
| LAFS.68.RST.3.7 | Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). | This standard is addressed in every unit of the Comprehensive Science 1 Course, during standard reading lessons, as well as when students read evidence cards and participate in using a simulation that has textual elements such as symbols, graphs and standard text. For example:<br>● In Lesson 4.1, Activities 2, 3 and 4 of the Magnetic Fields unit, students are introduced to and examine three designs for a faster roller coaster, along with experiments that support these designs. Students read and annotate all relevant documents (three roller coaster designs and accompanying experiments) all of which include complex diagrams and |

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| | | texts that students need to interpret.<br>● In Lesson 2.3, Activity 2 of the Force and Motion unit, students re-read the article “Designing Wheelchairs” in order to review and consider the concepts to mass, velocity and force as they related a real-life scenario: wheelchairs. They then apply this understanding in Activity 3, where they use the digital Modeling Tool to explain how mass, velocity and force can help explain how a spacecraft moved. The modeling tool offers a visual, graphic way of showing these concepts.<br>● In Lesson 3.4, Activity 2 in the Metabolism unit, students read the article, “Blood Doping: Messing with Metabolism to Win Races.” The article contains several diagrams that support a student’s understanding of what blood doping is, and how the oxygen levels differ for an athlete who blood dopes and one who does not. In Lesson 3.5, Activity 4, students re-read the article and focus specifically on one of the diagrams during this read. In addition, students use the article in Activity 5, to help them revise a model they previously made, showing what happens to an athlete who blood dopes.<br>● In Lesson 2.3, Activity 2 of the Weather Patterns unit, students re-read a section of the article “Disaster in California!” focusing on understanding how energy, temperature and the height of a cloud reaches in the troposphere are related to how much rainfall a storm provides. In Activity 3, students apply this understanding to an activity in the Weather Patterns simulation, where they simulate different sizes of rainstorms and make observations and collect data about which of these factors affect the amount of rainfall in each storm they model. |
| LAFS.68.RST.3.8 | Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. | This standard is addressed in multiple units of the Comprehensive Science 1 Course. For example:<br>● In Lesson 2.2, Activity 2 and the following Activity, “Teacher: Play and Discuss Video Message” in the Microbiome unit, students are introduced to a fictitious senate bill that a senator is proposing. The bill is set to cut funding for fecal transplant and microorganism research. Students are challenged to learn more about this line of research so that they can dispute claims this senator has made about the efficacy and validity of using fecal transplants to cure infections. Students spend the next 5 lessons reading about various studies and trying to understand what happens with the microorganisms in the human gut before and after a fecal transplant, and collect evidence to write letters to the senator explaining the value in this procedure. |

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| LAFS.68.RST.3.9 | Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. | This standard is addressed in multiple units of the Comprehensive Science 1 Course. For example:<br>● In Lesson 1.5, Activity 2 of the Magnetic Fields unit, students re-read a section of the article, ‘Earth's Geomagnetism" in order to find evidence about field lines and about how field lines can help to predict if two magnets will attract, repel or both. Next, in Activity 3, students continue this investigation and evidence collection using data from the Magnetic Fields simulation.<br>● In Lesson 3.3, Activity 2 of the Metabolism unit, students read and annotate a short article called "Growth and Repair" which describes how the body's cells grow and repair themselves. The teacher then projects the Metabolism simulation, and the class compares what they learned during reading to what they observe from the simulation. Finally, In Activity 3, students use the Metabolism Modeling Tool to model their understanding of growth and repair.<br>● In Lesson 1.5, Activity 2 of the Weather Patterns unit, students re-read a portion of the article "What are Clouds?" to better understand how clouds form and how energy plays a role in this. Next, in Activity 3, students use information from the reading to guide them as they use the Weather Patterns simulation to create clouds with varying amounts of rainfall and energy. |
| LAFS.68.WHST.1.1 | Write arguments focused on discipline-specific content. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. Establish and | This standard is addressed in all units of the Comprehensive Science 1 Course. For example:<br>● During Lessons 4.1 (for example, Activity 3) and 4.2 (for example, Activity 3) of the Force and Motion unit, students consider evidence and claims about how to create a specific kind of crash in a movie, using miniature set pieces. In order to analyze the evidence, students use the content knowledge they have gained throughout the unit about force, mass and velocity. In Lesson 4.3, Activity 4 students write arguments to address the question, "What is the difference between Claire's test of the collision scene where Vehicle 2 fell off the cliff, and the film, Iceworld Revenge, where it did not?" Students base their arguments on the evidence the examined in the previous two lessons. This writing activity is constructed so that students' arguments can contain content from the entire unit.<br>● During Lessons 4.1 (for example, Activity 3) and 4.2 (for example, Activity 3) of the Ocean, Atmosphere and Climate unit, students consider evidence and claims about whether the average air temperature in an |

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| | maintain a formal style. Provide a concluding statement or section that follows from and supports the argument presented. | area of South China during the Carboniferous period was the same, warmer or cooler than it is today. In order to analyze the evidence, students use the content knowledge they have gained throughout the unit about climate, temperature, ocean currents, energy and the atmosphere. In Lesson 4.3 students write arguments that address the question about air temperature during the Carboniferous period that they have been examining. This writing activity is constructed so that students' arguments can contain content from the entire unit. |
| LAFS.68.WHST.1.2 | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. Use precise language and domain-specific vocabulary to inform about or explain the topic. Establish and maintain a formal style and objective tone. Provide a concluding statement or section that follows from and supports the information or explanation presented. | This standard is addressed in all units of the Comprehensive Science 1 Course. For example:<br>● In Lesson 8, during the activity titled, 'Introducing the Recipe Proposal" of the Metabolism Engineering Internship unit, students read a sample design proposal so that they can observe the tone and construction of the arguments they will be writing, and are introduced to the rubric that will be used to provide feedback about their proposals the rubric includes categories that describe the use of relevant, domain specific vocabulary that should be included. In Lesson 8 (see activity titled "Drafting the Design Overview"), students write draft proposals, which receive feedback about the content as well as overall writing and vocabulary use, and in Lesson 9 (see activity titled "Finalizing the Written Proposal") they revise their proposals based on this feedback. In addition, throughout the last 3 lessons of this unit, students are reminded to establish and maintain a formal style and objective tone in their proposal writing.<br>● In Lesson 4.3 of the Magnetic Fields unit, during the Activity titled, Introducing the Homework, the teacher reviews with students what they will need to include in order to complete their final arguments. In addition, the teacher reviews what it means to write convincingly. In Activity 4, students write final arguments. |

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| LAFS.68.WHST.2.4 | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. | This standard is addressed in all units of the Comprehensive Science 1 Course. For example:<br>● In Lessons 8 and 9 (see Lesson 8, activity titled "Drafting the Design Overview" and Lesson 9, activity titled "Finalizing the Written Proposal") of the Metabolism Engineering Internship unit, students are introduced to the task of developing an Engineering Proposal that explains which recipe is best for their (fictitious) company to create, based on criteria such as taste, cost and the amount of energy it will provide for those who eat the bars. Students develop, revise and organize their written proposals during this series of lessons, and consider the style (through examination of a rubric, and after receiving feedback about their proposals) as well as audience.<br>● In Lesson 2.5, Activity 5 of the Microbiome unit, students write arguments for a press release intended to convince people that fecal transplants are helpful and should be funded. They organize their thinking prior to writing, by considering each piece of possible evidence they might use in a tool called the Reasoning Tool. Students are encouraged to consult the work they did with the Reasoning Tool to help them develop and organize their arguments, and are reminded about the style, task, purpose. In Lesson 2.7, Activities 2 and 3, students write the second half of this press release argument, and follow similar procedures as in Lesson 2.5. They are also provided with time to revise their original arguments from Lesson 2.5 as needed. |
| LAFS.68.WHST.2.5 | With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. | This standard is addressed in all units of the Comprehensive Science 1 Course. Most units in the Course end with a 3-day Science Seminar Sequence. This sequence provides time for students to examine evidence about a novel scientific problem that requires them to use content from the rest of the unit. Students discuss their ideas about this problem in a discourse routine called the Science Seminar, then independently write final arguments based on the thinking they did during the sequence. For example:<br>● In Lesson 8, during the Activity titled, 'Introducing the Recipe Proposal" of the Metabolism Engineering Internship unit, students review their role as engineering interns and consider the audience to whom they will be addressing their proposals -- their project director. They read a sample design proposal so that they can observe the tone and construction of the arguments they will be writing, and are introduced to the rubric that will be used to provide feedback about their proposals. In Lessons 8 and 9 (see Lesson 8, activity titled "Drafting the Design Overview" and |

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| | | Lesson 9, activity titled “Finalizing the Written Proposal”) students write draft proposals, receive feedback, and revise their proposals based on this feedback.<br>● In Lesson 4.3, Activity 2 of the Force and Motion unit, during which students begin to prepare to write their final arguments. They first choose a claim they want to support in their writing, then use a tool called the Reasoning Tool to consider, analyze, and organize their evidence. In Activity 3, students further organize their thinking by examining what they have done with the reasoning tool and deciding which evidence to include in their writing. All of these activities prepare students to write their arguments in Activity 4. In addition, as they write in Activity 4, students are provided with supportive scaffolds such as Scientific Argumentation Sentence Starters to support their use of appropriate language and tone. |
| LAFS.68.WHST.2.6 | Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. | This standard is addressed in all units of the Comprehensive Science 1 Course. For example:<br>● In Lesson 4.3, Activity 4 in the Metabolism Unit (see the Teacher Support note titled Instructional Suggestion: Literacy Note: Additional Modalities for Sharing Arguments) students are presented with presentation options for their final argument, including publishing to a class webpage or blog.<br>● In Lesson 2.4, Activity 2 in the Metabolism unit, students collect data about the condition they are studying (either asthma, anemia, EPI or diabetes) using the Metabolism simulation. As they work in small groups, students use this simulation-produced data to help them diagnose the condition of a fictitious patient, Elisa, in Lesson 2.7, Activity 2. Finally, in Activity 3, students write arguments supporting a diagnosis for Elisa, and use data collected with the simulation along with consideration of information they gather from the Metabolism Digital Modeling Tool in Activity 2, to support their arguments. Each member of the group works together to make the diagnosis and shares in the ownership of the published diagnosis they create.<br>● In Lesson 3.3, Activity 2 in the Weather Patterns unit, students create models to show what they think is happening to cause recent storms in the fictitious town of Galetown to be so severe, then discuss their models with a partner in Activity 3. Students then write and publish reports, explaining to the citizenry of Galetown why they have been suffering from more severe storms lately, and make predictions about |

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| | | whether or not these strong storms will continue. |
| LAFS.68.WHST.3.7 | Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. | This standard is addressed in many units of the Comprehensive Science 1 Course. For example:<br>● In Lesson 2.2 of the Microbiome unit, students are asked to research what fecal transplants are and how they work. Over the course of the next few lessons students read the results of several studies (see for example, Lesson 2.2, Activity 3) and use this information to write arguments about fecal transplants in Lesson 2.5 (see Activity 5) and Lesson 2.7 (see Activity 3) Students also choose a claim to support for the writing they do in Lesson 2.7.<br>● In Lessons 2.2, 2.3, and 2.4 of the Metabolism unit, students research different conditions (anemia, asthma, diabetes or EPI) that a patient might have and eventually diagnose the patient (see for example, Lesson 2.3, Activity 2). In Lesson 2.7 (see Activity 3) they write scientific arguments describing which condition they feel the patient has. Their arguments use evidence from a variety of sources that they investigated during the previous lessons.<br>● In Lesson 1.3, Activity 3 of the Ocean, Atmosphere and Currents unit, students conduct a short investigation using the Ocean, Atmosphere and Currents simulation to answer the question, “How does air get energy?” In Activity 4 they discuss the evidence they gathered from the simulation, then write about this topic, using evidence they’ve gathered from the simulation and elsewhere. |
| LAFS.68.WHST.3.8 | Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. | This standard is addressed in all units of the Comprehensive Science 1 Course. For example:<br>● In every unit, students can use the search function in the Amplify Library to search and find relevant content within articles.<br>● In Lesson 4.1 of the Magnetic Fields unit, students are asked to decide which one of three designs for a magnetically-driven roller coaster they think is the best, based on evidence. During this lesson (Activity 3) students examine and annotate these designs, and consider accompanying experiments in order to gather evidence for their eventual written arguments. In Lesson 4.2, Activity 2, they collect more evidence through use of the Magnetic Fields simulation. After discussing the evidence for and against each of the three designs with their class in Lesson 4.3, Activity 3, students write arguments that are supported |

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| | | through the evidence they've examined and collected during the prior three days.<br>● In Lesson 3.5, Activities 3-5 in the Metabolism unit, students first model what an athlete's body would look like with regard to oxygen intake using the Metabolism Modeling Tool, then reread the article, "Blood Doping: Messing with Metabolism to find out more about this topic. They then use the Modeling Tool again to model an athlete's body who blood doped. Finally, in Activity 5, students use the Metabolism simulation to find out how to get the highest rate of cellular respiration possible with this tool. All of these activities provide evidence and background information to support students' evaluation of specific evidence they receive in Lesson 4.1 about one athlete who may or may not have blood doped, and support the argument writing students complete in Lesson 4.3.<br>● The Weather Patterns unit prioritizes the consideration of source as an important criterion students should learn about and use. Beginning in Lesson 3.2, Activity 2, students are asked to read and analyze a set of possible evidence and sort it according to how reliable each source of evidence is. Each piece of evidence comes from a different source, and students evaluate the sources and make conclusions about the inherent biases of each before deciding which data they should rely upon during the next activity. In Activity 5, students re-read a section of the article "Disaster in California!" that they read in a previous lesson, and reflect in writing on which sources from the article seem more reliable than others, based on their burgeoning understanding of more and less reliable sources. Finally, in Lesson 4.1, Activity 2, students again decide which sources are more and less reliable from a new set of evidence cards; they discard sources deemed unreliable then use the remaining evidence to write strong arguments in Lesson 4.3, Activity 3. |
| LAFS.68.WHST.3.9 | Draw evidence from informational texts to support analysis reflection, and research. | This standard is addressed in all units of the Comprehensive Science 1 Course. For example:<br>● In all Science Seminar Sequences, which occur in all core units in the Life Science Course, students spend either 1-2 days reading, analyzing and participating in research using evidence cards and other sources. Then, at the end of the sequence, students use evidence derived from these sources to support writing final arguments for the unit.<br>● In Lesson 3.5, Activity 4 of the Metabolism unit, students conduct a second read of part of the article "Blood Doping: Messing with |

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| | | Metabolism to Win Races." During this read, they collect evidence that allows them to compare the amount of oxygen in a normal and blood doped body, as well as the amount of oxygen absorbed by the cells for each body. In addition, students make predictions about what a blood-doped body needs, using the article to support their thinking, and, in the next Activity, use what they read to help reflect upon their learning and revise a model of the body that they'd made with the digital Modeling Tool before reading. |
| LAFS.68.WHST.4.10 | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. | This standard is addressed in all units of the Comprehensive Science 1 Course. Students write in virtually every lesson, for a wide variety of purposes. Some examples are:<br>● In Lesson 4.3, Activity 4 of the Force and Motion unit, students write final arguments to culminate their Science Seminar experience. These arguments contain content from the entire unit and serve as a culminating experience for the unit.<br>● In the Metabolism unit, students write about a patient's condition several times: recording observations about different conditions represented in the Metabolism simulation for homework in Lesson 2.2, Activity 4; responding to questions about a particular condition after reading in Activity 2, Lesson 2.3; making annotations to explain a what they did during a simulation activity in Lesson 2.3, Activity 4; recording observations from simulation tests in Activity 2, Lesson 2.4 and finally, preparing for and writing arguments about a condition in Lesson 2.7, Activity 3. |
| MAFS.6.EE.3.9 | Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem | This standard is addressed throughout the Weather Patterns unit. For example:<br>● In Lesson 1.3, Activity 3 (see the Teacher Support tab), students use the unit's Data Tool to graph weather data. This activity enables students to model mathematically the relationship between different variables, such as temperature change, energy released, amount of cloud formed, and amount of rain formed, and to see how one variable can affect another. Students then have the opportunity to determine the equation that relates temperature difference to one of the other variables: students draw a line of best fit for the data and use it to determine the slope and equation.<br>● In Lesson 2.1, Activity 2 (see the Teacher Support tab) of that same unit, students again use the Data Tool to analyze how starting air parcel temperature affects how high the parcel rises. Students graph the data |

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| | involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time. | they collect in the Weather Patterns simulation, determine a line of best fit, and write an equation relating the two variables. |
| MAFS.6.SP.2.4 | Display numerical data in plots on a number line, including dot plots, histograms, and box plots. | This standard is addressed in the Ocean, Atmosphere, and Climate unit. In Lesson 1.4, Activity 2 ( see the note titled “Instructional Suggestion: Going Further: Mathematical Thinking” in the Teacher Support tab) students complete a sim extension activity where they gather numerical data about temperature and latitude and display it in dot plots on a number line. Students use their dot plots to draw conclusions about temperatures at different latitudes. |
| MAFS.6.SP.2.5 | Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | This standard is addressed across multiple units in the Comprehensive Science 2 course. For example:<br>● In Lesson 3.2, Activity 3 of Weather Patterns, students analyze data sets representing weather conditions (e.g., temperature, wind speed, rainfall) of storms around the world to identify patterns across all storms to conclude that wind led to an increased amount of rain in each storm.<br>● In Lesson 1.5, Activity 3 of Ocean, Atmosphere, and Climate, students analyze a series of bar graphs, identifying the features of the graph they are using to get information (title, axis labels, and data), the variables that the graph shows (air temperature, year), and the units of measurement (degrees, years). Students use the graphs to draw conclusions about a specific location (e.g., the air temperature is cooler in New Zealand during El Niño years).<br>● In Lesson 2.2, Activity 3 of the Microbiome unit, students analyze data represented in pie charts to summarize the effects of changes to the human microbiome on a person’s health.<br>● In Lesson 5 of the Metabolism Engineering Internship unit, in the activity titled “Analyzing Data,” students use the data they collected from a digital simulation about the nutritional value of their nutrition bar recipes and determine which recipe best meets the metabolic needs of a population. Also in this activity (see the Teacher Support tab), students compare their recipes by calculating and using the average percent of growth and repair needs met, average percent energy needs meet after different amounts of time. |

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| HE.6.C.1.3 | Identify environmental factors that affect personal health. | This standard is addressed across multiple units in the Life Science Course. For example:<br>● In Microbiome, students investigate the microbiome of the human body and how new microorganisms introduced to the microbiome can help or harm personal health. Also in this unit, students investigate the effect of antibiotics on the human microbiome (see for example, Lesson 2.2, Activity 3, and Lesson 2.3, Activity 2) .<br>● In Metabolism, students read about and and analyze the effects of limited oxygen in the environment on the process of cellular respiration (see for example, Lesson 4.1, Activity 3) |
| HE.6.C.1.5 | Explain how body systems are impacted by hereditary factors and infectious agents. | This standard is addressed across multiple units in the Life Science Course. For example:<br>● In Microbiome, students investigate the microbiome of the human body and how new microorganisms introduced to the microbiome can help or harm personal health (see for example, Lesson 2.2, Activity 3)..<br>● In Metabolism, in Lesson 2.2, Activity 2, students read and analyze information from series of articles, Patient Stories, which describe medical conditions that can affect the functioning of body systems, resulting in the cells of the body not getting enough of the important molecules they need to function. |
| ELD.K12.ELL.SC.1 | English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science. | In every Amplify Science unit, students are supported in developing science vocabulary and scientific language structures in oral discourse and in writing. For example:<br>● In the Magnetic Fields unit, Lesson 4.3, Activity 2, students' use Argumentation Sentence Starters to support their use of scientific language as they discuss claims and evidence about the best design for a roller coaster launcher.<br>● In the Weather Patterns Unit, Lesson 1.6, Activity 2, students use a Word Relationships routine to consider how key vocabulary words relate to one another and to practice forming sentences with these key words. |
| ELD.K12.ELL.SI.1 | English language learners communicate for social and instructional purposes within the school setting. | Student-to-student talk and writing-to-learn are important aspects of the pedagogical approach throughout Amplify Science, and Amplify Science uses a set of research-based principles for supporting English language learners in their oral and written participation:<br>● Access and build on students' background knowledge.<br>● Capitalize on students' knowledge of language. |

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| | | <ul><li>Provide additional scaffolds for language.</li><li>Provide explicit instruction about the language of science.</li><li>Offer multiple entry points into science content.</li><li>Provide multiple means of expressing science content knowledge.</li></ul>These principles are built into each unit. For example:<ul><li>Students are provided with scaffolds for oral and written language use, such as sentence starters (see for example, Force and Motion, Lesson 4.2, Activity 2).</li><li>In all core units, students use modeling tools to create visual representations of their explanations, providing English learners with an opportunity to express their understanding visually in addition to in writing (see for example, Metabolism, Lesson 2.3, Activity 3)</li><li>Teachers are provided with suggestions for how to group students in order to support English learners (see for example, Microbiome, Lesson 1.1, in the Differentiation Brief, section titled, "Specific Differentiation Strategies for English Learners", note titled "Strategically choose partners for ELs."</li><li>Teachers are encouraged to capitalize on English learners' language knowledge, for example by pointing out Spanish-English cognates (see for example, Microbiome, Lesson 2.1, in the Differentiation Brief, section titled, "Specific Differentiation Strategies for English Learners", note titled "Accessing cognates for Spanish-speaking students."</li></ul> |
| MAFS.K12.MP.1.1 | Make sense of problems and persevere in solving them. | Making sense of problems and persevering in solving them is a common characteristic of Amplify Science units. Each unit begins with a real-world problem that students address over the course of the unit, distilling patterns from data, synthesizing across a variety of evidence sources (e.g., text, tables, and graphs), and creating models to illustrate relationships between ideas. For example:<ul><li>In Metabolism Engineering Internship (see Lesson 1, the activity titled "Introducing Project Phases and Roles"), students assume their role as FuturaBar Engineers and work to make sense of the problem they are trying to solve. Students are actively considering, discussing, and reflecting on the problem context as they work to understand the larger problem of how to provide a nutritional remedy to people involved in a natural disaster. As they persevere in solving this problem, they strategically break it down into smaller parts, look for correspondences between and across quantitative data, and frequently use visual representations to search for the best solution for the problem at hand.</li></ul> |

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| | | • In Force and Motion (see Lesson 1.2, the activity titled “The Missing Seconds Video”), students assume the role of student physicists working for the fictional Universal Space Agency. They are called upon to investigate why a space pod failed to dock at a space station. Students tackle this question one piece at a time, drawing on a range of data, including force, velocity, and mass of moving objects, to explain why the space pod collided with the space station and started moving in the opposite direction.<br>• In Weather Patterns (see Lesson 1.2, the activity titled “Introducing the Mystery of Galetown Storms”), students assume the role of student forensic meteorologists as they investigate how water vapor, temperature, energy transfer, and wind influence local weather patterns in a fictional town. Using weather data, physical models, a digital simulation, and hands-on activities, and science texts, students investigate the mechanisms by which a warm weather rainstorm can be generated, through the lens of energy transfer. |
| MAFS.K12.MP.2.1 | Reason abstractly and quantitatively. | This standard is addressed across multiple units in the Comprehensive Science 1 course. For example:<br>• In Lesson 4, the “Designing and Testing Recipes” Activity of the Metabolism Engineering Internship, students work to design a nutritional bar. As they do so, they move back-and-forth between manipulating symbols abstractly and attending to the meaning of those symbols while doing so. The Metabolism Engineering Internship asks students to engage in contextualizing and decontextualizing as they work iteratively between the FuturaBar nutritional value data and the need to create an affordable solution they can take to scale. Students are also making connections regarding the nutritional value provided by various ingredients and the resulting output of available energy.<br>• In Lesson 1.6, Activity 1 of Weather Patterns, students analyze weather data (amount of rainfall, level of local surface water) from different storms. They decontextualize by observing patterns in the quantitative data about the different storms; they then contextualize the data by using it to support a claim about the cause of severe storms. |
| MAFS.K12.MP.3.1 | Construct viable arguments and critique the reasoning of others. | This standard is addressed across multiple units in the Comprehensive Science 1 course. For example:<br>• In Lesson 7 of the Metabolism Engineering Internship, in the activity titled Finalizing Recipes (see the Teacher Support tab), students |

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| | | calculate the percent increase or decrease in different recipes of nutritional bars for various factors (taste score, cost, average percent of growth and repair needs met, average percent of energy needs met after 15 minutes, and average percent of energy needs met after 60 minutes). This activity allows students to analyze how their design has changed and to use how much their design has improved to support their argument for their final designs.<br>● In Lesson 1.6, Activity 2 of Magnetic Fields, students use data (field line models) to refute a claim that a misaligned launcher was the cause of a spacecraft traveling so much faster than expected.<br>● In Lesson 1.6, Activity 3 of Weather Patterns, students investigate the effect of more water vapor in the air on the amount of rainfall to help them evaluate a claim that a lake in the fictional town of Galetown caused more rain in that town. |
| MAFS.K12.MP.4.1 | Model with mathematics. | This standard is addressed across multiple units in the Comprehensive Science 1 course. For example:<br>● In Lesson 1.2, Activity 3 of the Microbiome unit, students created scaled diagrams of two microorganisms at 20,000 times their actual size. In Lesson 1.3, Activity 2, students investigate how the scale of molecules relates to the scale of cells and add the scale of molecules to their diagrams.<br>● In Lesson 2.2, Activity 2 (see the Teacher Support tab) of Magnetic Fields, students examine the relationship between speed and kinetic energy. They calculate the kinetic energy of a spacecraft for multiple launches. Students then use the Data Tool: Kinetic Energy vs. Speed to create a graph to visually analyze the relationship between kinetic energy and speed.<br>● In Lesson 2.1, Activity 2 of Weather Patterns (see the Teacher Support tab), students use the Data Tool to mathematically model how the starting temperature of an air parcel affects how high the parcel rises. Students use temperature and height data from the sim to create a scatter plot and draw a best fit line for the data. Using the line, students are prompted to determine the slope and an equation for their line. |
| MAFS.K12.MP.5.1 | Use appropriate tools strategically. | This standard is addressed across multiple units in the Comprehensive Science 1 course. For example:<br>● In Lesson 4, the “Designing and Testing Recipes” Activity of the Metabolism Engineering Internship, students work to design a nutritional |

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| | | <ul><li>bar by gathering data from the RecipeTest sim about the percent of protein and carbohydrates in each recipe and the glycemic index and determine the best recipe.</li><li>In Lesson 3.1, Activity 2 (see the Teacher Support tab) of Magnetic Fields, students examine the relationship between the initial distance between magnets and the distance the magnet travels. Students complete additional tests at different initial distances between magnets and then create a graph using the Data Tool: Force vs. Distance that allows them to visualize the relationship between initial distance and distance travelled.</li></ul> |
| MAFS.K12.MP.6.1 | Attend to precision. | This standard is addressed across multiple units in the Comprehensive Science 1 course. For example:<ul><li>In Lesson 2.7, Activity 3 of Microbiome, students will have many opportunities to attend to precision as they use evidence from pie charts representing percentages of different microorganisms in a patient's microbiome to explain why the fecal transplant cured the patient of the C. difficile infection. Attending to precision means that students aim to communicate precisely to others, both in the evidence they present and the corresponding reasoning that links this evidence to a claim.</li><li>In Lesson 1.4, Activity 3 of Force and Motion, students engage in a firsthand investigation during which they use stronger and weaker forces to launch various objects and compare how different strength forces affect the velocities of identical objects. To complete this activity, students must attend precisely to the way they are launching objects, measuring distance, and recording their data.</li></ul> |
| MAFS.K12.MP.7.1 | Look for and make use of structure. | This standard is addressed across multiple units in the Comprehensive Science 1 course. For example:<ul><li>In Lesson 1.5, Activity 3 of Magnetic Fields, students are tasked with determining how field lines look when magnets repel, attract, or both. They will use this structure to make field line models, which will serve as evidence in support of or against various claims about why a spacecraft was traveling so much faster than expected.</li><li>In Lesson 1.4, Activity 2 of Oceans, Atmosphere, and Currents, students examine maps to identify patterns of energy transfer on Earth, concluding that there is more energy transferred to the parts of Earth that are closer to the equator and less energy transferred to parts further away from the equator.</li></ul> |

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| MAFS.K12.MP.8.1 | Look for and express regularity in repeated reasoning. | This standard is addressed across multiple units in the Comprehensive Science 1 course. For example:<br>● In Lesson 2.4, Activity 2 of Metabolism, students use the Metabolism sim to examine the number of glucose, amino acid, and oxygen molecules absorbed by cells in a healthy body and body with a medical condition. After conducting multiple trials for each condition, students recognize patterns in number of molecules absorbed by cells in the body under different conditions.<br>● In Lesson 1.4, Activity 3 of Force and Motion (see the Teacher Support tab), students collect quantitative data by measuring the time it takes for a jar band to travel 100 cm when propelled by a weak or strong force. They can describe the velocity by calculating the speed and indicating the direction of motion. Students gain an understanding of velocity and use quantitative data to determine the relationship between strength of force and size of velocity change.<br>● In Lesson 2.3, Activity 3 of Weather Patterns, students analyze and graph weather data to identify patterns and regularity in the relationship between the starting temperature of an air parcel, amount of rain, the height the parcel rises, and the amount of energy transferred out. Students discover relationships such as: as the starting air parcel temperature increases, the amount of rain also increases. |