

2022 - 2023, Fifth Grade, Science, Quarter 1

Big Ideas/Key Concepts:	
<ul style="list-style-type: none"> ● Animal responses can be compared and contrasted as either inherited or learned. ● Offspring inherit traits from their parents. ● Traits can be inherited or learned from the environment. ● Organisms that change with their environments may be better adapted to survive. ● Engineers use a variety of technologies, even simple technologies, to solve problems. ● Fossils can help us determine how rock strata were formed. 	
Standards	Student Friendly “I Can” Statements
<p><u>LS1: From Molecules to Organisms: Structures and Processes</u></p> <p>5.LS1.1 Compare and contrast animal responses that are instinctual versus those that are gathered through the senses, processed, and stored as memories to guide their actions.</p>	<p><u>From Molecules to Organisms: Structures and Processes</u></p> <p>I can explain that an animal’s instinctual response is not learned over time but instead comes naturally to the animal.</p> <p>I can explain that an animal’s learned response is gathered through its senses, processed, and stored as memories that guide their actions.</p> <p>I can classify whether an animal’s behavior is instinctive or learned.</p>
<p><u>LS3: Heredity: Inheritance and Variation of Traits</u></p> <p>5.LS3.1 Distinguish between inherited characteristics and those characteristics that result from a direct interaction with the environment. Apply this concept by giving examples of characteristics of living organisms that are influenced by both inheritance and the environment.</p>	<p><u>Heredity: Inheritance and Variation of Traits</u></p> <p>I can research and evaluate inherited traits and those traits that result from a direct interaction with the environment (e.g., a lizard inheriting its tail vs a lizard losing its tail to a predator).</p> <p>I can give examples of traits of living organisms that are influenced by both inheritance and the environment (e.g., a dog’s size is influenced by both its breed [inherited] and its diet & exercise [environment]).</p>

<p>5.LS3.2 Provide evidence and analyze data that plants and animals have traits inherited from parents and that variations of these traits exist in a group of similar organisms.</p> <p><i>Note: 5th grade students are NOT responsible for knowing Punnett squares, alleles, or homozygous/heterozygous genes. These concepts will be covered in 7th grade.</i></p>	<p>I can provide evidence through research and direct observations that plants and animals have traits inherited from parents.</p> <p>I can describe that within a group of similar organisms there might be variations of a specific trait (e.g., height, eye color, etc).</p>
<p><u>LS4: Biological Change: Unity and Diversity</u></p> <p>5.LS4.2 Use evidence to construct an explanation for how variations in characteristics among individuals within the same species may provide advantages to these individuals in their survival and reproduction.</p>	<p><u>Biological Change: Unity and Diversity</u></p> <p>I can use evidence to explain how an individual’s physical characteristics may provide survival advantages over other individuals from the same species within an environment (e.g., light- vs dark-peppered moth populations).</p> <p>I can explain that an animal with advantages in an environment is more likely to survive and reproduce.</p>
<p>5.LS4.1 Analyze and interpret data from fossils to describe types of organisms and their environments that existed long ago. Compare similarities and differences of those to living organisms and their environments. Recognize that most kinds of animals (and plants) that once lived on Earth are now extinct.</p>	<p>I can study various fossils to describe types of organisms and their environments that existed long ago.</p> <p>I can compare similarities and differences of fossils to living organisms and their environments.</p> <p>I can describe that most kinds of animals (and plants) that once lived on Earth are now extinct.</p>
<p><u>ESS1: Earth’s Place in the Universe</u></p> <p>5.ESS1.7 Use evidence from the presence and location of fossils to determine the order in which rock strata were formed.</p>	<p><u>Earth’s Place in the Universe</u></p> <p>I can use evidence from the presence and location of fossils to determine the order in which rock layers were formed.</p>

	I can use the presence of fossils within rock layers to recognize if natural forces (e.g., earthquakes, landslides, etc.,) have caused a shift in the rock layers over time.
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Embedded K-8 TN Computer Science Standards:

- **AIT.5** Evaluate the accuracy, relevance, appropriateness, and bias of electronic information sources.
- **AIT.6** Collect, organize, analyze, and interpret data to identify solutions and/or make informed decisions.
- **AIT.7** Infer and predict or propose relationships with data.
- **DC.1** Advocate, demonstrate, and routinely practice safe, legal, and responsible use of information and technology.
- **DC.2** Exhibit a positive mindset toward using technology that supports collaboration, learning, and productivity.

2022 - 2023, Fifth Grade, Science, Quarter 2

Big Ideas/Key Concepts:	
<ul style="list-style-type: none"> ● Matter can undergo phase changes between a solid, liquid, or gas, and these changes can be explained. ● The Law of Conservation of Mass is explored to demonstrate that matter cannot be lost or regained. ● Two or more substances that are mixed together may result in a mixture with a change of certain properties. ● Different variables affect dissolving solids into liquids; this can be shown through a design process. ● Technology has advanced through the years to make what cannot be seen by the naked eye visible. 	
Standards	Student Friendly “I Can” Statements
<p><u>PS1: Matter and Its Interactions</u></p> <p>5.PS1.1 Analyze and interpret data from observations and measurements of the physical properties of matter to explain phase changes between a solid, liquid, or gas. <i>Note: 5th grade students should observe data gathered during a phase change, but 5th grade students are NOT responsible for explaining particle-level causes for phase changes.</i></p>	<p><u>Matter and Its Interactions</u></p> <p>I can explain that matter experiences a change of form when physical conditions change.</p> <p>I can explain that matter has physical properties which include phase changes. For example, at sea level, water will boil to a gas when its temperature reaches 100 degrees Celsius and freeze to a solid when its temperature reaches 0 degrees Celsius.</p> <p>I can analyze data and use measurements made during phase changes to describe physical properties of matter such as boiling point and melting point.</p>
<p>5.PS1.2 Analyze and interpret data to show that the amount of matter is conserved even when it changes form, including transitions where matter seems to vanish.</p>	<p>I can explain that matter is made up of particles too small to be seen.</p> <p>I can take measurements and gather data to show that the amount of matter is conserved when it changes form, even when it appears to vanish.</p>

<p>5.PS1.3 Design a process to measure how different variables (temperature, particle size, stirring) affect the rate of dissolving solids into liquids.</p>	<p>I can design a process to measure how <u>temperature</u> affects the rate of dissolving solids into liquids.</p> <p>I can design a process to measure how <u>particle size</u> affects the rate of dissolving solids into liquids.</p> <p>I can design a process to measure how <u>stirring</u> affects the rate of dissolving solids into liquids.</p> <p>I can use the results of my investigations to describe how different variables such as temperature, particle size, or stirring affect the rate of dissolving solids into liquids.</p>
<p>5.PS1.4 Evaluate the results of an experiment to determine whether the mixing of two or more substances results in a change of properties.</p>	<p>I can investigate and interpret the results of an experiment where two or more substances were mixed together to determine what type of property change(s) took place.</p> <p>I can evaluate when mixing two or more substances creates a new substance with different physical properties.</p> <p>I can evaluate when mixing two or more substances together results in the substances simply being mixed together, without a change in their physical properties.</p>
<p>Embedded K-8 TN Computer Science Standards:</p> <ul style="list-style-type: none"> ● AIT.1 Identify and define problems and form significant questions for investigation. ● AIT.2 Develop a plan to use technology to find a solution and create projects. ● AIT.5 Evaluate the accuracy, relevance, appropriateness, and bias of electronic information sources. ● AIT.6 Collect, organize, analyze, and interpret data to identify solutions and/or make informed decisions. ● AIT.7 Infer and predict or propose relationships with data. ● DC.1 Advocate, demonstrate, and routinely practice safe, legal, and responsible use of information and technology. ● DC.2 Exhibit a positive mindset toward using technology that supports collaboration, learning, and productivity. 	

2022 - 2023, Fifth Grade, Science, Quarter 3

Big Ideas/Key Concepts:	
<ul style="list-style-type: none"> ● Earth has a specific place in the Universe, which can explain relative distance and why the Sun appears brighter than other stars. ● Different bodies in our solar system can be categorized based on their physical properties and motion. ● The positions of the Sun, moon, and Earth affect what we see in the day and night sky, including positions of constellations. ● The cause of changes in day lengths and seasons can be researched and observed. ● The tilt of the Earth's axis as it revolves around the Sun impacts how much direct sunlight a location receives throughout a year. ● Engineers design and create prototypes to solve a problem. They test their designs and look for failure points to make improvements. 	
Standards	Student Friendly "I Can" Statements
<p><u>ESS1: Earth's Place in the Universe</u> 5.ESS1.1 Explain that differences in the apparent brightness of the Sun compared to other stars is due to their relative distances from the Earth.</p>	<p><u>Earth's Place in the Universe</u> I can explain that all stars produce light, but only the sun is close enough to illuminate our planet and create a period called day.</p> <p>I can explain that the sun appears much larger and brighter than other stars because the sun is much closer to Earth.</p> <p>I can compare the Sun's brightness and proximity to Earth to that of other stars (i.e. absolute and apparent magnitude).</p> <p>I can identify the four major star types relating to the stellar life cycle (i.e. main sequence, giant, super giant, and white dwarf stars).</p>
<p>5.ESS1.2 Research and explain the position of the Earth and the solar system within the Milky Way galaxy, and compare the size and shape of the Milky Way to other galaxies in the universe.</p>	<p>I can research and explain the position of the Earth and the solar system within the Milky Way galaxy.</p> <p>I can compare the size and shape of the Milky Way to other galaxies in the universe.</p>

	I can identify the four major galaxy types based on their size and shape (i.e. spiral, elliptical, lenticular, and irregular galaxies).
5.ESS1.3 Use data to categorize different bodies in our solar system including moons, asteroids, comets, and meteoroids according to their physical properties and motion.	<p>I can research information on different objects found in our solar system (moons, asteroids, comets, and meteoroids) to categorize them based on their physical properties and motion.</p> <p>I can explain that the circular motion of the planets is caused by the Sun's gravitational pull, while the circular motion of moons is caused by the gravitational pull of the planet they orbit.</p>
5.ESS1.4 Explain the cause and effect relationship between the positions of the Sun, Earth, and Moon and resulting eclipses, position of constellations, and appearance of the Moon.	<p>I can use a model to explain that the positions of Earth, the Moon, and the Sun affect what we see in the day and night sky, including the position of constellations.</p> <p>I can use a model to explain how the cycle of the Moon's phases depends on the relative positions of Earth, the Moon, and the Sun.</p> <p>I can use a model to explain that a solar eclipse happens when our view from Earth of the Sun is being blocked by the position of the Moon.</p> <p>I can use a model to explain that a lunar eclipse happens when the Moon is positioned in Earth's shadow from the Sun.</p>
5.ESS1.5 Relate the tilt of the Earth's axis, as it revolves around the Sun, to the varying intensities of sunlight at different latitudes. Evaluate how this causes changes in day-lengths and seasons.	I can explain how the tilt of the Earth's axis as it revolves around the Sun affects the amount and intensity of sunlight that different latitudes receive throughout the year.
5.ESS1.6 Use tools to describe how stars and constellations appear to move from the Earth's perspective throughout the seasons.	I can use a star chart to describe how stars and constellations appear to move from our perspective throughout the year.
<u>ETS2: Links Among Engineering, Technology, Science, and Society</u>	<u>Links Among Engineering, Technology, Science, and Society</u>
5.ETS2.2 Describe how human beings have made tools and machines (x-ray cameras, microscopes, satellites, computers) to observe and do	

things that they could not otherwise sense or do at all, or as quickly or efficiently.	I can describe how tools, technology, and inventions are always being developed to help answer new questions and solve problems more quickly or efficiently.
5.ETS2.3 Identify how scientific discoveries lead to new and improved technologies.	I can describe how scientific discoveries have led to new and improved technologies.
<p>Embedded K-8 TN Computer Science Standards:</p> <ul style="list-style-type: none"> ● DC.1 Advocate, demonstrate, and routinely practice safe, legal, and responsible use of information and technology. ● DC.2 Exhibit a positive mindset toward using technology that supports collaboration, learning, and productivity. ● DC.3 Exhibit leadership for digital citizenship. ● DC.4 Recognize and describe the potential risks and dangers associated with various forms of online communications (e.g., cell phones, social media, digital photos). ● DC.5 Explain responsible uses of technology and digital information; describe possible consequences of inappropriate use such as copyright infringement and piracy. 	

2022 - 2023, Fifth Grade, Science, Quarter 4

Big Ideas/Key Concepts:

- Both balanced and unbalanced forces affect the motion of objects.
- Using the engineering design process, students can design a solution for a problem involving forces and interactions.
- Using simple hand and measuring tools, a prototype of a solution can be constructed, tested to discover a point of failure, and revised with that failure point in mind to improve its overall effectiveness.
- On Earth, the force of gravity is directed towards the Earth's center.
- Gravity interacts with mass and distance; these can be analyzed.
- The nervous and digestive systems have unique functions within the human body that contribute to health. (WCS Standards)

Standards	Student Friendly "I Can" Statements
<p><u>PS2: Motion and Stability: Forces and Interactions</u></p> <p>5.PS2.1 Test the effects of balanced and unbalanced forces on the speed and direction of motion of objects.</p>	<p><u>Motion and Stability: Forces and Interactions</u></p> <p>I can compare and contrast balanced and unbalanced forces.</p> <p>I can investigate the effects of balanced and unbalanced forces on the speed and direction of motion of objects.</p> <p>I can explain that whether an object is at rest or in motion, a system of forces acts on the object.</p>
<p>5.PS2.2 Make observations and measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.</p>	<p>I can observe and measure an object's motion to predict its future motion.</p> <p>I can analyze data to provide evidence that a pattern can be used to predict future motion.</p>
<p>5.PS2.3 Use evidence to support that the gravitational force exerted by Earth on objects is directed toward the Earth's center.</p>	<p>I can use evidence to support the claim that the gravitational pull of Earth is directed toward Earth's center.</p>

	I can explain how “down” is a different direction depending on where a person is standing on Earth.
5.PS2.4 Explain the cause and effect relationship of two factors (mass and distance) that affect gravity.	<p>I can explain that gravity is an attractive force which acts on all objects, but this force is EXTREMELY small unless the objects are very large like the Sun or a planet.</p> <p>I can analyze data to provide evidence that the force of gravity between objects is stronger when the objects are closer together, and weaker when the objects are farther apart.</p> <p>I can explain the cause and effect relationship of mass and distance as they relate to gravity.</p>
5.PS2.5 Explain how forces can create patterns within a system (moving in one direction, shifting back and forth, or moving in cycles), and describe conditions that affect how fast or slowly these patterns occur.	<p>I can use a model to show how forces can create patterns of movement within a system, i.e. moving in one direction, shifting back and forth, or moving in cycles.</p> <p>I can use my model to describe conditions that affect how fast or slowly patterns within a system occur.</p>
<u>ETS1: Engineering Design</u>	<u>Engineering Design</u>
5.ETS1.1 Research, test, retest, and communicate a design to solve a problem.	I can research, test, retest, and communicate a design to solve a problem.
5.ETS1.2 Plan and carry out tests on one or more elements of a prototype in which variables are controlled and failure points are considered to identify which elements need to be improved. Apply the results of tests to redesign the prototype.	<p>I can test a prototype to gather data on how it performs and which parts of it need to be improved.</p> <p>I can apply the results of tests to redesign a prototype.</p>
5.ETS1.3 Describe how failure provides valuable information toward finding a solution.	I can describe how failure provides valuable information toward finding a solution.
<u>ETS2: Links Among Engineering, Technology, Science, and Society</u>	<u>Links Among Engineering, Technology, Science, and Society</u>

<p>5.ETS2.1 Use appropriate measuring tools, simple hand tools, and fasteners to construct a prototype of a new or improved technology.</p>	<p>I can use appropriate measuring tools, simple hand tools, and fasteners to build a prototype of a new or improved technology.</p>
<p><u>Human Body Systems</u></p> <p>5.WCE.SC.1 Identify the parts of the nervous system and their functions. <i>Introduced after TCAP – this standard is not assessed.</i></p>	<p><u>Human Body Systems</u></p> <p>I can identify the parts of the nervous system (nervous system, brain, spinal cord, neurons) and their functions.</p> <p>I can correctly label a diagram of the nervous system.</p>
<p>5.WCE.SC.2 Identify the parts of the digestive system and their functions. <i>Introduced after TCAP – this standard is not assessed.</i></p>	<p>I can identify the parts of the digestive system (teeth, tongue, throat, esophagus, stomach, large intestine, small intestine) and their functions.</p> <p>I can correctly label a diagram of the digestive system.</p>
<p>Embedded K-8 TN Computer Science Standards:</p> <ul style="list-style-type: none"> ● AIT.1 Identify and define problems and form significant questions for investigation. ● AIT.2 Develop a plan to use technology to find a solution and create projects. ● AIT.5 Evaluate the accuracy, relevance, appropriateness, and bias of electronic information sources. ● AIT.6 Collect, organize, analyze, and interpret data to identify solutions and/or make informed decisions. ● AIT.7 Infer and predict or propose relationships with data. ● DC.1 Advocate, demonstrate, and routinely practice safe, legal, and responsible use of information and technology. ● DC.2 Exhibit a positive mindset toward using technology that supports collaboration, learning, and productivity. ● DC.4 Recognize and describe the potential risks and dangers associated with various forms of online communications (e.g., cell phones, social media, digital photos). ● DC.5 Explain responsible uses of technology and digital information; describe possible consequences of inappropriate use such as copyright infringement and piracy. 	