2022 - 2023, Second Grade, Science, Quarter 1

Big Ideas/Key Concepts:
- **Many animals use their body parts and senses in many important ways.**
- **Animals are classified based on their physical characteristics.**
- **Species have unique and diverse life cycles.**
- **Animals meet their needs by using their surroundings and other living things.**
- **Animals respond to changes in their environments.**
- **Traits are inherited from parents, but variations occur.**

Standards	Student Friendly "I Can" Statements
From Molecules to Organisms: Structures and Processes	**From Molecules to Organisms: Structures and Processes**
2.LS1.1 Use evidence and observations to explain that many animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. *Note: First-hand observations and text may be used as evidence. The features used as examples for this standard should be limited to external structures that are visible to the naked eye.*	I can make observations and use research to explain that animals use their body parts and senses in different ways to meet their basic needs and interact with their habitats. I can obtain and communicate information about the basic needs of an animal such as how it protects itself, moves from place to place, and finds food or water.
2.LS1.2 Obtain and communicate information to classify animals (vertebrates-mammals, birds, amphibians, reptiles, fish, invertebrates-insects) based on their physical characteristics.	I can research a variety of animals and classify them according to patterns in their physical characteristics (vertebrates-mammals, birds, amphibians, reptiles, fish, invertebrates-insects).
2.LS1.3 Use simple graphical representations to show that species have unique and diverse life cycles. *Note: This standard focuses on the life cycles of animals. Students in first grade explored the life cycles of plants (1.LS1.2).*	I can use simple models to compare and contrast the unique and diverse life cycles of different species of animals.

Ecosystems: Interactions, Energy, and Dynamics **2.LS2.1** Develop and use models to compare how animals depend on their surroundings and other living things to meet their needs in the places they live.	**Ecosystems: Interactions, Energy, and Dynamics** I can make a model to show how animals depend on their habitats and other living things to meet their needs (shelter, protection, food, water). I can compare how different animals meet their needs in their habitats.
2.LS2.2 Predict what happens to animals when the environment changes (temperature, cutting down trees, wildfires, pollution, salinity, drought, land preservation).	I can predict what happens to animals when the environment changes <u>suddenly</u> (wildfires, etc.). I can predict what happens to animals when the environment changes <u>slowly</u> (temperature change, etc.).
Heredity: Inheritance and Variation of Traits **2.LS3.1** Use evidence to explain that living things have physical traits inherited from parents and that variations of these traits exist in groups of similar organisms.	**Heredity: Inheritance and Variation of Traits** I can use a Venn Diagram to show how physical traits between a parent and its offspring can be similar or different. I can use evidence to explain that a group of similar organisms will have variations in their physical traits.

Embedded K-8 TN Computer Science Standards:
- **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.3** Exhibit leadership for digital citizenship.

2022 - 2023, Second Grade, Science, Quarter 1

2022 - 2023, Second Grade, Science, Quarter 2

<table>
<tr><td colspan="2">

Big Ideas/Key Concepts:
- **Earth's natural processes have a beginning and an end while some others are cyclical.**
- **Erosion is a problem which requires a human solution.**
- **Erosion changes the shape of a landform.**
- **Water is found in the ocean, rivers, streams, lakes, and ponds.**
- **Water can be found in liquid and solid states within bodies of water.**
- **By asking questions, making observations, and gathering accurate information, simple problems can be defined and solved.**
- **More complex problems need to be broken into smaller parts then pieced together again in order to reach a solution.**

</td></tr>
</table>

Standards	Student Friendly "I Can" Statements
Earth's Place in the Universe **2.ESS1.1** Recognize that some of Earth's natural processes are cyclical, while others have a beginning and an end. Some events happen quickly, while others occur slowly over time.	**Earth's Place in the Universe** I can explain that some of the natural processes that occur on Earth are cyclical, while others have a beginning and an end. I can compare and contrast natural events that happen quickly and natural events that occur slowly over time. I can describe the scale of time needed for a slow natural event to change the surface of the Earth.
Earth's Systems **2.ESS2.2** Observe and analyze how blowing wind and flowing water can move Earth materials (soil, rocks) from one place to another,	**Earth's Systems** I can investigate how blowing wind and flowing water can move Earth materials (soil, rocks) from one place to another.

changing the shape of a landform and affecting the habitats of living things. *Note: Examples of types of landforms may include hills, river banks, valleys, and dunes.*	I can use a model to explain how blowing wind and flowing water can change the shape of a landform. I can use a model to explain how blowing wind and flowing water can affect the habitats of living things.
2.ESS2.3 Compare simple maps of different land areas to observe the shapes and kinds of land (rock, soil, sand) and water (river, stream, lake, pond).	I can read maps of different areas to compare and contrast the types of land (rock, soil, sand) and water (river, stream, lake, pond).
2.ESS2.4 Use information obtained from reliable sources to explain that water is found in the ocean, rivers, streams, lakes, and ponds, and may be solid or liquid.	I can obtain information to identify where water is found on Earth and that it may be a solid or liquid. I can explain that water is found in the ocean, rivers, streams, lakes, and ponds, and may be solid or liquid.
2.ESS2.1 Compare the effectiveness of multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	I can compare the effectiveness of different solutions designed to slow or prevent wind or water from changing the shape of the land.
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. ● **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.	

2022 - 2023, Second Grade, Science, Quarter 3

<table>
<tr><td colspan="2" style="background-color:#d6e0f0">Big Ideas/Key Concepts:
● There is a cause and effect relationship between vibrating materials and sound.
● Light and sound travel in waves and send signals, which can be observed and investigated.
● Waves move in regular patterns.
● Defining a problem, drafting a solution, breaking a problem apart, and evaluating different solutions for strengths and weaknesses are all parts of the engineering design process.</td></tr>
</table>

Standards	Student Friendly "I Can" Statements
<u>**Waves and Their Applications in Technologies for Information Transfer**</u> **2.PS4.1** Plan and conduct investigations to demonstrate the cause and effect relationship between vibrating materials (tuning forks, water, bells) and sound.	<u>**Waves and Their Applications in Technologies for Information Transfer**</u> I can investigate the cause and effect relationship between vibrating materials (tuning forks, water, and bells) and sound. I can demonstrate that sound transfers energy from one place to another and can cause other things to vibrate.
2.PS4.2 Use tools and materials to design and build a device to understand that light and sound travel in waves and can send signals over a distance.	I can explain how messages can be sent and received across a distance using light and/or sound. I can design and build a device to demonstrate that light and sound can send signals over a distance.
2.PS4.3 Observe and demonstrate that waves move in regular patterns of motion by disturbing the surface of shallow and deep water. *Note: Shallow wave behavior occurs when the depth of the water is less than the wave's amplitude (height). A wave will break if the water is less than half as deep as the wave's height.*	I can show that waves move in regular patterns across the surface of shallow and deep water. I can compare and contrast a wave moving in shallow water and a wave moving in deep water.

Engineering Design	Engineering Design
2.ETS1.1 Define a simple problem that can be solved through the development of a new or improved object or tool by asking questions, making observations, and gather accurate information about a situation people want to change.	I can ask questions, make observations, and gather accurate information to define a situation people want to change.
2.ETS1.2 Develop a simple sketch, drawing, or physical model that communicates solutions to others.	I can communicate my solutions to others by drawing, sketching, or constructing a model.
2.ETS1.3 Recognize that to solve a problem, one may need to break the problem into parts, address each part, and then bring the parts back together	I can solve a problem by focusing on each part of the problem, fixing it, and then bringing the parts back together.
2.ETS1.4 Compare and contrast solutions to a design problem by using evidence to point out strengths and weaknesses of the design.	I can use evidence to find strengths and weaknesses of solutions to a design problem. I can compare the effectiveness of different solutions by pointing out their strengths and weaknesses.
Links Among Engineering, Technology, Science, and Society **2.ETS2.1** Use appropriate tools to make observations, record data, and refine design ideas.	**Links Among Engineering, Technology, Science, and Society** I can use appropriate tools to make observations, record data, and refine design ideas.
2.ETS2.2 Predict and explain how human life and the natural world would be different without current technologies.	I can make a simple drawing to show the purpose of a current technology. I can obtain information to explain that technologies depend on resources found in the natural world.

	I can predict and explain how human life and the natural world would be different without current technologies.

Embedded K-8 TN Computer Science Standards:
- **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.
- **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, Second Grade, Science, Quarter 4

Big Ideas/Key Concepts:
● **Pushes and pulls can be evaluated when objects collide and are connected.**
● **Multiple pushes and pulls can have a variety of effects on an object's movement or non-movement.**
● **Friction is both a way to produce heat and a way to increase/decrease the motion of an object.**

Standards	Student Friendly "I Can" Statements
Motion and Stability: Forces and Interactions **2.PS2.1** Analyze the push or the pull that occurs when objects collide or are connected.	**Motion and Stability: Forces and Interactions** I can design and carry out an investigation to explore the effects of pushing and pulling on one or more objects. I can analyze the push or pull that occurs when objects collide or are connected to one another.
2.PS2.2 Evaluate the effects of different strengths and directions of a push or a pull on the motion of an object. *Note: Forces that are not either parallel or perpendicular to an object's motion are beyond the scope of this standard due to the complexity of resolving such forces.*	I can evaluate and describe the effects of different strengths of a single push or pull on an object's motion. I can evaluate and describe the effects of different directions of a single push or pull on an object's motion.
2.PS2.3 Recognize the effect of multiple pushes and pulls on an object's movement or non-movement. *Note: Students can use symbols such as arrows of different sizes/lengths to represent relative sizes of forces without actual measurements.*	I can investigate the effect of multiple pushes and pulls on an object's movement or non-movement. I can apply multiple pushes or pulls to cause an object to move along a set path (e.g., around a circle, through a maze).
Energy	**Energy**

2.PS3.1 Demonstrate how a stronger push or pull makes things go faster and how faster speeds during a collision can cause a bigger change in the shape of the colliding objects. *Note: This standard is not focused on the nature of pushes or pulls, but rather on energy. At this grade, discussions of energy, by name, are not appropriate due to the abstract complexity of energy. Measurements can be relative comparisons of the degree to which an object is deformed during a collision.*	I can demonstrate how a stronger force (push or pull) makes things go faster. I can demonstrate how faster speeds can cause a bigger change in the shape of colliding objects. I can analyze the results of a collision to describe whether it was caused by a weak force or a strong force.
2.PS3.2 Make observations and conduct experiments to provide evidence that friction produces heat and reduces or increases the motion of an object. *Note: Observations of temperature changes can be limited to relative descriptions (warm/hot/cool etc.)*	I can investigate friction to explore how it reduces the motion of an object. I can investigate friction to show it produces heat energy as it reduces the motion of an object.

Embedded K-8 TN Computer Science Standards:
- **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.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, Second Grade, Science, Quarter 4