

## Introduction

Science, Technology & Engineering, and Environmental Literacy & Sustainability (STEELS) Standards guide the study of the natural and human-made world through inquiry, problem-solving, critical thinking, and authentic exploration. This document displays a curriculum framework for Grade 1 Science. It is designed to focus curriculum and teaching, provide guidance for multiple approaches to curriculum development, encourage less reliance on textbooks as curriculum, and avoid activity-oriented teaching without focus/purpose.

## Science Long Term Transfer Goals

In support of the Curriculum Framework, Long Term Transfer Goals (LTTG) provide the overarching practices that ground the foundation for a robust curriculum; thus, all curriculum should relate to one or more of the LTTGs detailed below – as they highlight the effective uses of understanding, knowledge, and skill that we seek in the long run; i.e., what we want students to be able to do when they confront new challenges – both in and outside of school.

Students will be able to engage as technological and engineering literate members of a global society, using their learning to:

1. Approach science as a reliable and tentative way of knowing and explaining the natural world and designed world.
2. Weigh evidence and use scientific approaches to ask questions, investigate, and make informed decisions.
3. Make and use observations to analyze relationships and patterns in order to explain phenomena, develop models, and make predictions.
4. Evaluate systems, in order to connect how form determines function and how any change to one component affects the entire system.
5. Explain how the natural and designed worlds are interrelated and the application of scientific knowledge and technology can have beneficial, detrimental, or unintended consequences.

**Grade: 1 Science**

Structure and Function						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Organisms have characteristic structures, functions, and behaviors that allow them to grow, reproduce, and die.	How do the structures of organisms enable life's functions?	<b>3.1.1.A</b> <b>Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.</b>	<b>Constructing Explanations and Designing Solutions</b> Use materials to design a device that solves a specific problem or a solution to a specific problem.	All organisms have external parts. Different animals use their body parts 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. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.  Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.	<b>Structure and Function</b> The shape and stability of structures of natural and designed objects are related to their function(s).  <b>Influence of Science, Engineering and Technology on Society and the Natural World</b> Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world.	external mimic problem solution design
Growth and Development of Organisms						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
The characteristic structures, functions, and behaviors of organisms change in predictable ways	How do organisms grow and develop?	<b>3.1.1.B</b> <b>Read texts and use media to determine patterns in behavior of parents and</b>	<b>Obtaining, Evaluating, and Communicating Information</b> Read grade-appropriate texts and use media to	Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in	<b>Patterns</b> Patterns in the natural and human designed world can be observed, used to	behavior observe organism survive offspring

as they progress from birth to old age.		<b>offspring that help offspring survive.</b>	obtain scientific information to determine patterns in the natural world.  <b>Connections to Nature of Science</b> Scientists look for patterns and order when making observations about the world.	behaviors that help the offspring to survive.	describe phenomena, and used as evidence.	patterns parents
<b>Inheritance of Traits</b>						
<b>Big Idea</b>	<b>Essential Question</b>	<b>Standard</b>	<b>Science and Engineering Practices</b>	<b>Disciplinary Core Idea</b>	<b>Crosscutting Concepts</b>	<b>Vocabulary</b>
Offspring resemble, but are not identical to, their parents due to traits being passed from one generation to the next via genes.	How are the characteristics of one generation related to the previous generation?	<b>3.1.1.C</b> <b>Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.</b>	<b>Constructing Explanations and Designing Solutions</b> Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.	Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents.  Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.	<b>Patterns</b> Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.	similar offspring observation evidence-based
<b>Wave Properties</b>						
<b>Big Idea</b>	<b>Essential Question</b>	<b>Standard</b>	<b>Science and Engineering Practices</b>	<b>Disciplinary Core Idea</b>	<b>Crosscutting Concepts</b>	<b>Vocabulary</b>
Waves are repeating patterns of motion that transfer energy and information without transferring matter.	What are the characteristic properties and behaviors of waves?	<b>3.2.1.A</b> <b>Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.</b>	<b>Planning and Carrying Out Investigations</b> Plan and conduct investigations collaboratively to produce evidence to answer a question.	Sound can make matter vibrate, and vibrating matter can make sound.	<b>Cause and Effect</b> Simple tests can be designed to gather evidence to support or refute student ideas about causes.	vibration energy investigation evidence material sound waves

Electromagnetic Radiation						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Electromagnetic radiation (e.g., radio, microwaves, light) can be modeled as a wave pattern of changing electric and magnetic fields that interact with matter.	What is light? How can one explain the varied effects that involve light? What other forms of electromagnetic radiation are there?	<b>3.2.1.B</b> <b>Make observations to construct an evidence-based account that objects can be seen only when illuminated.</b>	<b>Constructing Explanations and Designing Solutions</b> Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.	Objects can be seen if light is available to illuminate them or if they give off their own light.	<b>Cause and Effect</b> Simple tests can be designed to gather evidence to support or refute student ideas about causes.	illuminate light observation evidence-based
Electromagnetic radiation (e.g., radio, microwaves, light) can be modeled as a wave pattern of changing electric and magnetic fields that interact with matter.	What is light? How can one explain the varied effects that involve light? What other forms of electromagnetic radiation are there?	<b>3.2.1.C</b> <b>Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.</b>	<b>Planning and Carrying Out Investigations</b> Plan and conduct investigations collaboratively to produce evidence to answer a question.	Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam.	<b>Cause and Effect</b> Simple tests can be designed to gather evidence to support or refute student ideas about causes.	light beam mirror reflect refract mirror investigation simple test
Information Technologies and Instrumentation						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Useful modern technologies and instruments have been designed based on an understanding of waves and their interactions with matter.	How are instruments that transmit and detect waves used to extend human senses?	<b>3.2.1.D</b> <b>Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.</b>	<b>Constructing Explanations and Designing Solutions</b> Use tools and materials provided to design a device that solves a specific problem.	People also use a variety of devices to communicate (send and receive information) over long distances.	<b>Influence of Engineering, Technology, and Science, on Society and the Natural World</b> People depend on various technologies in their lives; human life would be very different without technology.	communicate distance sound device

The Universe and Its Stars						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
We can infer information about stars based on observations we make from Earth.	What is the universe, and what is Earth’s place in it? What is the universe, and what goes on in stars?	<b>3.3.1.A</b> <b>Use observations of the sun, moon, and stars to describe patterns that can be predicted.</b>	<b>Analyzing and Interpreting Data</b> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.	Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.	<b>Patterns</b> Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.  <b>Scientific Knowledge Assumes an Order and Consistency in Natural Systems</b> Science assumes natural events happen today as they happened in the past. Many events are repeated.	changes describe moon observe patterns predict stars sun
Earth and the Solar System						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Observations of the sky can be explained by predictable patterns of the movement of Earth, moon, sun and planets.	What are the predictable patterns caused by Earth’s movement in the solar system?	<b>3.3.1.B</b> <b>Make observations at different times of year to relate the amount of daylight to the time of year.</b>	<b>Planning and Carrying Out Investigations</b> Make observations (firsthand or from media) to collect data that can be used to make comparisons.	Seasonal patterns of sunrise and sunset can be observed, described, and predicted.	<b>Patterns</b> Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.	predict solar system daylight sky sunrise sunset patterns