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 Kindergarten 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 Kindergarten

Organization for Matter and Energy Flow in Organisms

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
The structures, functions, and behaviors of organisms allow them to obtain, use, transport, and remove the matter and energy needed to sustain them.	How do organisms obtain and use the matter and energy they need to live and grow?	**3.1.K.A** **Use observations to describe patterns of what plants and animals (including humans) need to survive.**	**Analyzing and Interpreting Data** Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.	All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	**Patterns** Patterns in the natural and human designed world can be observed and used as evidence.	observation patterns human designed world environment leaves organism adaptation structure survive

Forces and Interactions

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
A change in motion of interacting objects can be explained and predicted by forces.	How can one predict an object's continued motion, changes in motion, or stability?	**3.2.K.A** **Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.**	**Analyzing and Interpreting Data** Analyze data from tests of an object or tool to determine if it works as intended.	Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes.	cause and effect explanation motion push pull speed force

Types of Interactions

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
All forces between objects, regardless of size or direction, arise from only a few types of interactions.	What underlying forces explain the variety of interactions observed?	**3.2.K.B** **Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and**	**Planning and Carrying Out Investigations** With guidance, plan and conduct an investigation in collaboration with peers.	Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes.	speed direction collide motion direction collide

		pulls on the motion of an object.	Scientists use different ways to study the world.	or direction of its motion and can start or stop it. When objects touch or collide, they push on one another and can change motion		investigation compare

Conservation of Energy and Energy Transfer

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Energy can be modeled as either motions of particles or as being stored in force fields.	What is energy?	**3.2.K.C** **Make observations to determine the effect of sunlight on Earth's surface.**	**Planning and Carrying Out Investigations** Make observations (firsthand or from media) to collect data that can be used to make comparisons. Scientists use different ways to study the world.	Sunlight warms Earth's surface.	**Cause and Effect** Events have causes that generate observable patterns.	describe earth data sunlight observe cause and effect energy
Energy can be modeled as either motions of particles or as being stored in force fields.	What is energy?	**3.2.K.D** **Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.**	**Constructing Explanations and Designing Solutions** Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.	Sunlight warms Earth's surface.	**Cause and Effect** Events have causes that generate observable patterns.	solution design tools cause structure cause and effect energy

Weather and Climate

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Weather and climate are shaped by complex interactions involving	What regulates weather and climate?	**3.3.K.A** **Use and share observations of local**	**Analyzing and Interpreting Data**	Weather is the combination of sunlight, wind, snow or rain, and	**Patterns** Patterns in the natural	sunny changes cloudy

sunlight, the ocean, the atmosphere, ice, landforms, and living things.		**weather conditions to describe patterns over time.**	Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.	temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.	world can be observed, used to describe phenomena, and used as evidence.	cold cool foggy hot observe partly cloudy patterns predict rainy snowy warm weather windy

Biogeology

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Life and the planet's nonliving systems impact one another.	How do living organisms alter Earth's processes and structures?	**3.3.K.B** **Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.**	**Engaging in Argument from Evidence** Construct an argument with evidence to support a claim.	Plants and animals can change their environment.	**Systems and System Models** Systems in the natural and designed world have parts that work together.	needs environment habitat system survival organisms argument evidence

Natural Resources

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
All materials, energy, and fuels that humans use are derived from natural sources, some of which are renewable over time and others are not.	How do Earth's surface processes and human activities affect each other? How do humans depend on Earth's resources?	**3.3.K.C** **Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.**	**Developing and Using Models** Use a model to represent relationships in the natural world.	Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.	**Systems and System Models** Systems in the natural and designed world have parts that work together.	argument evidence system model needs habitat survival evidence

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Natural Hazards

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Natural processes can cause sudden or gradual changes to Earth's systems, some of which may adversely affect humans.	How do natural hazards affect individuals and societies?	**3.3.K.D** **Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.**	**Asking Questions and Defining Problems** Ask questions based on observations to find more information about the designed world. **Obtaining, Evaluating, and Communicating Information** Read grade appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.	Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.	**Cause and Effect** Events have causes that generate observable patterns.	weather conditions evaluate hazard natural natural hazard process region solution cause and effect

Human Impact on Earth Systems

Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Human activities in agriculture, industry, and everyday life has an impact on the land, rivers, ocean, and air.	How do humans change the planet?	**3.3.K.E** **Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.**	**Obtaining, Evaluating, and Communicating Information** Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.	Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their **i**mpacts on the land, water, air, and other living things.	**Cause and Effect** Events have causes that generate observable patterns.	recycle reduce reuse communicate cause and effect solutions choice impact land water

						air