Grade Kindergarten
Science Curriculum Framework

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 curricula 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 scientifically 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.

LIFE SCIENCE

Organization for Matter and Energy Flow in Organisms						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
All living things require specific resources to survive and grow.	How do we figure out if living things need the same resources to survive?	**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.	animal grow plant resource survive

PHYSICAL SCIENCE

Forces and Motion						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
A push or a pull can change the speed or direction of an object.	How does a push or a pull change how things move?	**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.	direction pull push speed

Types of Interactions						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
Different directions and strengths of pushes and pulls will have different effects on the motion of the object.	How does the direction and strength of a push or a pull affect the motion of the object?	**3.2.K.B** **Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.**	**Planning and Carrying Out Investigations** With guidance, plan and conduct an investigation in collaboration with peers. Scientists use different ways to study the world.	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. When objects touch or collide, they push on one another and can change motion.	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes.	motion
Conservation of Energy and Energy Transfer						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
The Earth's surface will be affected by the sun.	What is the effect of sunlight on Earth's surface?	**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.	sunlight surface

Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
The warming effect of the sun can be reduced.	How can we design a solution to reduce the heat of the sun on a surface?	**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.	

EARTH & SPACE SCIENCE

Weather and Climate						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
Local weather conditions can be observed and classified into patterns.	How does weather change each day?	**3.3.K.A** **Use and share observations of local weather conditions to describe patterns over time.**	**Analyzing and Interpreting Data** Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.	Weather is the combination of sunlight, wind, snow or rain, and 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.	**Patterns** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.	weather

Biogeology						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
Animals and plants can change the environment to meet their needs	How do plants and animals change their environments to help them meet their needs?	**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.	environment survive
Natural Resources						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
Plants and animals live in environments where they have what they need to survive.	Why do plants and animals live in some environments but not others?	**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 and/or develop a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s).	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.	

Natural Hazards						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
We can use weather forecasting to prepare for and respond to severe weather.	How do weather patterns help us prepare for all kinds of weather, including severe weather?	**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. Asking questions, making observations, and gathering information are helpful in thinking about problems.	**Cause and Effect** Events have causes that generate observable patterns.	severe weather weather forecast
Human Impact on Earth Systems						
Key Understanding	**Driving Question**	**Standard**	**Science and Engineering Practices**	**Disciplinary Core Idea**	**Crosscutting Concepts**	**Vocabulary**
There are ways to reduce the effect that humans have on the land, water, air, and/or other living things in a local environment.	How can we reduce impact that humans have on the land, water, air, and other living things?	**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. Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.	**Cause and Effect** Events have causes that generate observable patterns.	impact reduce