



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 2 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 2 Science

Interdependent Relationships in Ecosystems							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How do organisms interact with the living and nonliving environments to obtain matter and energy?	3.1.2.A Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Planning and Carrying Out Investigations Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.	Plants depend on water and light to grow.	Cause and Effect Events have causes that generate observable patterns.	environment survive organism species	S4.B.1.1.1 S4. B.1.1.5 S4.B.2.1.1
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How do organisms interact with the living and nonliving environments to obtain matter and energy?	3.1.2.B Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	Developing and Using Models Develop a simple model based on evidence to represent a proposed object or tool.	Plants depend on animals for pollination or to move their seeds around.	Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s).	minerals soil sunlight water	S4.B.2.1.1 S4.B.2.1.2
Biodiversity and Humans							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
Biodiversity—the multiplicity of genes, species, and ecosystems—provides humans with renewable	What is biodiversity, how do humans affect it, and how does it affect humans?	3.1.2.C Make observations of plants and animals to compare the diversity	Planning and Carrying Out Investigations Make observations (firsthand or from	There are many different kinds of living things in any area, and they exist in different	Patterns Patterns in the natural world can be observed, used to describe	biodiversity microorganisms needs	S4.B.2.1.1 S4.B.2.1.2

resources, such as food, medicines, and clean water.		of life in different habitats.	media) to collect data which can be used to make comparisons.	places on land and in water.	phenomena, and used as evidence.	organism survive exist habitats land living things water	
Structure and Properties of Matter							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
All forms of matter exist as a result of the combination or rearrangement of atoms.	How do particles combine to form the variety of matter one observes?	3.2.2.A Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.	Planning and Carrying Out Investigations Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.	Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.	Patterns Patterns in the natural and human designed world can be observed.	classify describe gas liquid matter patterns solid weight color flexibility properties texture investigations	S4.C.1.1.1 S4.A.1.1 S4.1.3.1 S4.A.2.1.4

All forms of matter exist as a result of the combination or rearrangement of atoms.	How do particles combine to form the variety of matter one observes?	3.2.2.B Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.	Analyzing and Interpreting Data Analyze data from tests of an object or tool to determine if it works as intended.	Different properties are suited to different purposes.	Cause and Effect Simple tests can be designed to gather evidence to support or refute student ideas about causes.	argument boiling cause and effect evidence freezing melting reverse data functions test	S4.C.1.1.1 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
All forms of matter exist as a result of the combination or rearrangement of atoms.	How do particles combine to form the variety of matter one observes?	3.2.2.C Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.	Constructing Explanations and Designing Solutions Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.	A great variety of objects can be built up from a small set of pieces.	Energy and Matter Objects may break into smaller pieces and be put together into larger pieces or change shapes.	construct design engineer problem solving solutions	S4.C.1.1.1 S4.A.1.1 S4.1.3.1 S4.A.2.1.4 S4.A.3.2.B S4.A.3.2 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
Chemical Reactions							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
The atoms of some substances combine or rearrange to form new	How do substances combine or change	3.2.2.D Construct an argument with evidence that	Engaging in Argument from Evidence	Heating or cooling a substance may cause changes that can be observed. Sometimes	Cause and Effect	construct design	S4.1.1.2 S4.A.1.1

substances that have different properties.	(react) to make new substances? How does one characterize and explain these reactions and make predictions about them?	some changes caused by heating or cooling can be reversed and some cannot.	Construct an argument with evidence to support a claim.	these changes are reversible, and sometimes they are not.	Events have causes that generate observable patterns.	disassemble engineer problem solving solutions	S4.1.3.1 S4.A.2.1.4 S4.A.3.2.B S4.A.3.2 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
The History of Planet Earth							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
Earth scientists use the structure, sequence, and properties of rocks, sediments, and fossils, as well as the locations of current and past ocean basins, lakes, and rivers, to reconstruct events in Earth's planetary history.	How do people reconstruct and date events in Earth's planetary history?	3.3.2.A Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	Constructing Explanations and Designing Solutions. Make observations from several sources to construct an evidence-based account for natural phenomena.	Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.	Stability and Change Things may change slowly or rapidly.	erosion weathering Earth materials landform geographic geologic geological map Pennsylvania features	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3

Earth Materials and Systems							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
Earth is a complex system of interacting subsystems: the geosphere, hydrosphere, atmosphere, and biosphere.	How do Earth's major systems interact?	3.3.2.B Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	Constructing Explanations and Designing Solutions Compare multiple solutions to a problem.	Wind and water can change the shape of the land.	Stability and Change Things may change slowly or rapidly.	accumulation condensation Earth evaporation groundwater lake landscape liquid moon ocean planet pond precipitation river solid/ice types of clouds vapor/gas	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3
Plate Tectonics and Large-Scale System Interactions							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
Plate tectonics is the unifying theory that	Why do the continents move, and what causes	3.3.2.C	Developing and Using Models	Maps show where things are located. One	Patterns	community	S4.A.1.1

explains the past and current movements of the rocks at Earth's surface and provides a coherent account of its geological history.	earthquakes and volcanoes?	Develop a model to represent the shapes and kinds of land and bodies of water in an area.	Develop a model to represent patterns in the natural world.	can map the shapes and kinds of land and water in any area.	Patterns in the natural world can be observed.	energy materials resources transportation	S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3
The Roles of Water in Earth's Surface Processes							
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	Vocabulary	2007 Assessment Anchors Eligible Content
Earth is often called the water planet because of the abundance of liquid water on its surface and because water's unique combination of physical and chemical properties is central to Earth's dynamics.	How do the properties and movements of water shape Earth's surface and affect its systems?	3.3.2.D Obtain information to identify where water is found on Earth and that it can be solid or liquid.	Obtaining, Evaluating, and Communicating Information Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question.	Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.	Patterns Patterns in the natural world can be observed.	ocean planet pond precipitation River solid/ice types of clouds vapor/gas	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3