



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 3 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 3 Science

Growth and Development of Organisms						
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?	3.1.3.A Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	Developing and Using Models Develop models to describe phenomena.	Growth and Development of Organisms Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.	Patterns Patterns of change can be used to make predictions.	organisms diverse life cycles reproduction unique
Social Interactions and Group Behavior						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Many species, live in groups which can increase the chances of survival for individuals and their relatives.	How do organisms interact in groups so as to benefit individuals?	3.1.3.B Construct an argument that some animals form groups that help members survive.	Engaging in Argument from Evidence Construct an argument with evidence, data, and/or a model.	Social Interactions and Group Behavior Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size.	Cause and Effect Cause and effect relationships are routinely identified and used to explain change.	organism interdependence cause and effect argument evidence
Inheritance of Traits						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
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?	3.1.3.C Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation	Analyzing and Interpreting Data Analyze and interpret data to make sense of phenomena using logical reasoning.	Inheritance of Traits Many characteristics of organisms are inherited from their parents. Variation of Traits	Patterns Similarities and differences in patterns can be used to sort and classify natural phenomena.	inherited variations evidence patterns

		of these traits exists in a group of similar organisms.		Different organisms vary in how they look and function because they have different inherited information.		
Variation of Traits						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Variation among individuals of the same species can be explained by both genetic and environmental factors.	Why do individuals of the same species vary in how they look, function, and behave?	3.1.3.D Use evidence to support the explanation that traits can be influenced by the environment.	Constructing Explanations and Designing Solutions Use evidence (e.g., observations, patterns) to support an explanation.	Inheritance of Traits Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. Variation of Traits The environment also affects the traits that an organism develops.	Cause and Effect Cause and effect relationships are routinely identified and used to explain change.	traits inheritance evidence variation cause and effect
Evidence of Common Ancestry and Diversity						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Comparisons between species provide evidence that species evolved from common ancestors which explains the similarities and differences between species.	What evidence shows that different species are related?	3.1.3.E Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	Analyzing and Interpreting Data Analyze and interpret data to make sense of phenomena using logical reasoning.	Evidence of Common Ancestry and Diversity Some kinds of plants and animals that once lived on Earth are no longer found anywhere. Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.	Scale, Proportion, and Quantity Observable phenomena exist from very short to very long time periods.	fossils organisms environments evidence scale extinction

Natural Selection						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
In any particular environment individuals with particular traits may be more likely than others to survive and produce offspring.	How does genetic variation among organisms affect survival and reproduction?	3.1.3.F Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.	Constructing Explanations and Designing Solutions Use evidence (e.g., observations, patterns) to construct an explanation.	Natural Selection Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.	Cause and Effect Cause and effect relationships are routinely identified and used to explain change.	variation species reproduce adaptation reproduce variation characteristics advantage cause and effect natural selection
Adaptation						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
When the environment changes, some individuals in a population may have traits that provide a reproductive advantage which over many generations can change the make-up of a population.	How does the environment influence populations of organisms over multiple generations?	3.1.3.G Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	Engaging in Argument from Evidence Construct an argument with evidence.	Adaptation For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.	Cause and Effect Cause and effect relationships are routinely identified and used to explain change.	habitat survival organism cause and effect adaptation
Biodiversity and Humans						
Big Idea	Essential Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Humans depend on biodiversity, the variety of species and ecosystems, for resources and human	What is biodiversity, how do humans affect it, and how does it affect humans?	3.1.3.H Make a claim supported by evidence about the merit of a solution to a problem caused when the	Engaging in Argument from Evidence Make a claim about the merit of a solution to a problem by citing relevant	Ecosystem Dynamics, Functioning, and Resilience When the environment changes in ways that affect a place's physical	Systems and System Models A system can be described in terms of its components and their interactions.	system biodiversity changes evidence climate change

actions can impact the diversity of species.		environment changes and the types of plants and animals that live there may change.	evidence about how it meets the criteria and constraints of the problem.	characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations. Biodiversity and Humans Populations live in a variety of habitats and change in those habitats affects the organisms living there.		environment
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Forces and Motion

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?	3.2.3.A Make and communicate observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	Planning and Carrying Out Investigations Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. Science knowledge is Based on Empirical Evidence Science findings are based on recognizing patterns.	Forces and Motion The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it.	Patterns Patterns of change can be used to make predictions.	motion pattern balanced forces unbalanced forces prediction
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?	3.2.3.B Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced	Planning and Carrying Out Investigations Plan and conduct an investigation collaboratively to produce data to serve as the basis	Forces and Motion Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces	Cause and Effect Cause and effect relationships are routinely identified.	motion patterns balanced forces unbalanced forces observation cause and effect

		forces on the motion of an object.	for evidence, using fair tests in which variables are controlled and the number of trials considered. Scientific Investigations Use a Variety of Methods Science investigations use a variety of methods, tools, and techniques.	acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion.		fair tests
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?	3.2.3.C Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.	Asking Questions and Defining Problems Ask questions that can be investigated based on patterns such as cause and effect relationships.	Types of Interactions Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other.	Cause and Effect Cause and effect relationships are routinely identified, tested, and used to explain change.	electric interactions magnetic interactions orientation
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?	3.2.3.D Define a simple design problem that can be solved by applying scientific ideas about magnets.	Asking Questions and Defining Problems Define a simple problem that can be solved through the development of a new or improved object or tool.	Types of Interactions Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two	Interdependence of Science, Engineering, and Technology Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process.	design magnetic forces forces interaction solution

magnets, on their orientation relative to each other.

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 sunlight, the ocean, the atmosphere, ice, landforms, and living things.	What regulates weather and climate?	3.3.3.A Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Analyzing and Interpreting Data Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships.	Weather and Climate Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next.	Patterns Patterns of change can be used to make predictions.	weather season climate patterns graphical displays data conditions
Weather and climate are shaped by complex interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things.	What regulates weather and climate?	3.3.3.B Obtain and combine information to describe climates in different regions of the world.	Obtaining, Evaluating, and Communicating Information Obtain and combine information from books and other reliable media to explain phenomena.	Weather and Climate Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.	Patterns Patterns of change can be used to make predictions.	weather season climate regions

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?	3.3.3.C Make a claim supported by evidence about the merit of a design solution that reduces the impacts of a weather-related hazard.	Engaging in Argument from Evidence Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.	Natural Hazards A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.	Cause and Effect Cause and effect relationships are routinely identified, tested, and used to explain change. Influence of Engineering, Technology, and Science Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better	natural hazard atmosphere impact data weather constraints

					<p>artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones)</p> <p>Science is a Human Endeavor Science affects everyday life.</p>	
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