

Grade 3

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 **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 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

Growth and Development of Organisms						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Organisms have different life cycles but share a similar pattern of life stages.	How and why do organisms have similar stages of life?	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.	birth death growth life cycle organism reproduction
Social Interactions and Group Behavior						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Some animals live in groups which can increase the chances of survival for individuals and their relatives.	How does living in groups increase an animal's chances of survival?	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.	survive

Inheritance of Traits						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Organisms inherit traits from their parents, however there are differences within groups of similar organisms.	Why don't all organisms of the same kind look alike?	3.1.3.C Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	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 Different organisms vary in how they look and function because they have different inherited information.	Patterns Similarities and differences in patterns can be used to sort and classify natural phenomena.	inheritance organism trait variation
Variation of Traits						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
The environment an organism lives in can influence its traits.	How can living in different environments affect the traits of plants and animals?	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.	trait

Evidence of Common Ancestry and Diversity						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Fossils help us learn about plants, animals, and environments from long ago.	How can fossils provide us with evidence about life and environments from the past?	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.	environment extinction fossil organism
Natural Selection						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Differences between living things of the same species can help some of them live longer and have more offspring.	How do different traits help some living things survive and reproduce, while other traits do not?	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.	predator prey reproduction species survive variation

Adaptation						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Not all habitats lead to the survival of every organism.	How do some organisms survive in specific habitats while others do not?	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.	adaptation habitat organism survive
Biodiversity and Humans						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Populations are affected when environments change and the things that live there may need to adapt or move to survive.	How can we use evidence to choose the best solution for plants and animals when the environment changes?	3.1.3.H Make a claim supported by evidence about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	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.	Ecosystem Dynamics, Functioning, and Resilience When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. Biodiversity and Humans Populations live in a variety of habitats and change in those habitats affects the organisms living there.	Systems and System Models A system can be described in terms of its components and their interactions.	environment population

PHYSICAL SCIENCE

Forces and Motion						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
The pattern of an object's motion can be predicted by observations and measurements.	How can we predict where an object in motion will move to next?	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
Forces can cause changes in an object's motion.	What happens when we change where and how strongly a force is applied to an object?	3.2.3.B Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Planning and Carrying Out Investigations Plan and conduct an investigation collaboratively to produce data to serve as the basis 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.	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 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.	Cause and Effect Cause and effect relationships are routinely identified.	balanced force motion unbalanced force

Types of Interactions						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Electric and magnetic interactions between two objects can cause movement, even when the objects don't touch.	How can objects that don't touch make each other move?	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 interaction force magnet magnetic interaction static electricity
Magnetic forces are useful in designing solutions to problems.	How can we use magnetic forces to solve problems?	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 magnets, on their orientation relative to each other.	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.	magnetic force

EARTH & SPACE SCIENCE

Weather and Climate						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
Charts and graphs show weather data and conditions that reveal patterns in seasons.	How can we use our weather data to predict future seasonal weather patterns?	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.	precipitation predict season temperature weather wind
Charts, graphs, and other sources of information can be used to describe climates in regions around the world.	How are climates different around the world?	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.	climate region

Natural Hazards						
Key Understanding	Driving Question	Standard	Science and Engineering Practices	Disciplinary Core Idea	Crosscutting Concepts	Vocabulary
There are several ways people can protect themselves during hazardous weather conditions.	What are some things people can do to stay safe during hazardous weather?	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 artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones) Science is a Human Endeavor Science affects everyday life.	natural hazard