

Reading Public Schools

Instilling a joy of learning and inspiring the innovative leaders of tomorrow



Science Curriculum Guide

Grade 5

Theme: Connections and Relationships in Systems

In Fifth Grade, student scientists...

- model, use evidence to support arguments, and utilize data about relationships and interactions of systems.
- learn that objects and organisms are connected to, interact with, and are influenced by each other and their environments. They learn about how matter and energy are cycled through these relationships.
- study the relationships between Earth and nearby objects in the solar system.
- learn about the relationship among Earth's systems including the water cycle and human practices with Earth's resources.
- build their ability to describe, analyze, and model connections and relationships of observable components of Earth systems.

MA Department of Education STE Curriculum Frameworks, 2016

Fifth Grade Content Standards

Earth and Space Science

- Earth's Place in the Universe
- Earth's Systems
- Earth and Human Activity

Technology/Engineering

- Technological Systems

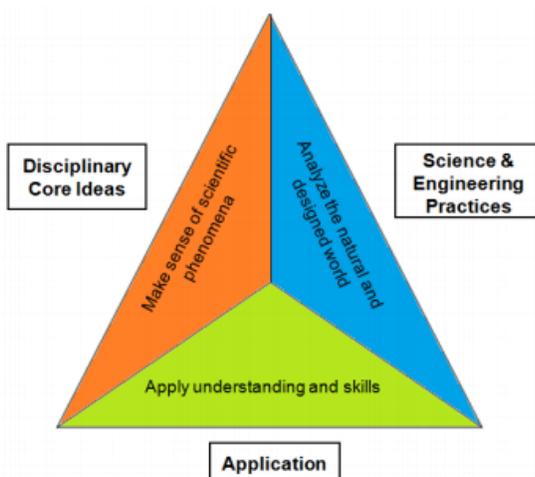
Physical Science

- Matter and Its Interactions
- Motion and Stability: Forces and Interactions
- Energy

Life Science

- From Molecules to Organisms: Structures and Processes
- Ecosystems: Interactions, Energy, & Dynamics

Components of STE Standards



The STE standards are designed to include three interrelated components: conceptual understanding of disciplinary core ideas, science and engineering practices, and application to the natural and designed world.

MA Department of Education STE Curriculum Frameworks, 2016

Science and Engineering Practices

The practice standards describe behaviors that scientists engage in as they investigate, build models, and construct theories about the natural world. They are a set of practices that engineers use as they design and build models and systems to solve problems. They are the skills that provide the foundation for scientific and technical reasoning.

1. Ask Questions and Define Problems
2. Develop and Use Models
3. Plan and Carry Out Investigations
4. Analyze and Interpret Data
5. Use Mathematical and Computational Thinking
6. Construct Explanations and Design Solutions
7. Engage in Argument from Evidence
8. Obtain, Evaluate, and Communicate Information



Core Ideas	Essential Questions	Resources/ Instructional Tools
Earth & Space Science: Earth’s Place in the Universe	<ul style="list-style-type: none"> • Why does the sun appear larger and brighter than other stars? • How can you use a model to explain: (1) day and night, (2) shadow patterns, (3) appeared changes in the position of the sun, moon, and stars? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Matter in Motion • Earth’s Materials
Earth & Space Science: Earth’s Systems	<ul style="list-style-type: none"> • How does water cycle through a watershed? • How can you display the relative amounts of salt water and fresh water across Earth’s biosphere? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Earth’s Materials • Water on Earth
Earth & Space Science: Earth and Human Activity	<ul style="list-style-type: none"> • How do communities reduce human impact on Earth’s resources and environment? • How would you design a system to filter particulates out of water? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Water on Earth • Light Energy and Matter
Life Science: From Molecules to Organisms: Structures and Processes	<ul style="list-style-type: none"> • How do plants use air, water, and sunlight for growth and reproduction? How could you test the process? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Matter and Energy Cycles • Ecosystem Interactions
Life Science: Ecosystems: Interactions, Energy, and Dynamics	<ul style="list-style-type: none"> • How could you build a model to show the movement of matter in an ecosystem? • How would you design a composter to encourage decomposition? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Matter and Energy Cycles • Ecosystem Interactions
Physical Science: Matter and Its Interactions	<ul style="list-style-type: none"> • How would you create a model to show phase changes between solid, liquid, and gas? • What impact do phase changes or reactions have on the mass of matter? • How can you use observations and measurements to describe characteristic properties? • How can you test to see if mixing two or more substances results in new substances or not? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Matter in Motion • Earth’s Materials • Matter and Electricity • Matter and Sound • Light Energy and Matter
Physical Science: Motion and Stability: Forces and Interactions	<ul style="list-style-type: none"> • How is the gravitational force exerted by earth directed? What evidence do you have? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Energy and Forces on Earth
Physical Science: Energy	<ul style="list-style-type: none"> • How can you use a model to show the energy in the food animals digest and how it’s utilized? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Matter and Energy Cycles • Energy and Forces on Earth • Matter and Electricity • Matter and Sound • Light Energy and Matter
Technology/Engineering: Technological Systems	<ul style="list-style-type: none"> • What examples can you provide for innovations and inventions? • How can you use sketches and drawings to show how each part of a product/device relates to other parts? 	Know Atom Unit(s): <ul style="list-style-type: none"> • Water on Earth • Energy and Forces on Earth • Matter and Sound • Light Energy and Matter

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Curriculum Guide Overview

Curriculum Guide	Curriculum guides are public documents that are aligned with the Massachusetts Department of Education Curriculum Frameworks. They focus on the set of standards that students will learn within certain disciplines at appropriate grade levels. Curriculum Guides are intended for teachers, parents, and the wider school community as an overview document of the course of study for the year.
Curriculum Map	Curriculum maps are internal documents utilized as planning tools for teachers. Curriculum maps keep a focus on the end-of-year standards and chart a course for the teaching and learning over the year. They are typically organized in a grade-level overview organized by month or marking period. Curriculum maps typically include; standards and expectations for the grade/content, essential skills/concepts, methods of assessment, and major content resources. Maps are never “done” as ongoing work of educators include revisions, additions, and revisits to the maps. They provide an overview for the year while also allowing educators to see a vertical picture of how the content develops as students progress through each grade.
Theme	Each grade is focused on a grade-level theme that links the standards and all four Science, Technology, and Engineering disciplines together. The standards used as the foundation of our curriculum come directly from the Massachusetts Department of Education Curriculum Frameworks. State standards may be viewed here: http://www.doe.mass.edu/frameworks/
Content Standards	Content Standards describe what students should know and be able to do within each grade-level.
Science & Engineering Practices	While presented as distinct skill sets, the eight practices intentionally overlap and interconnect. These skills should be reflected in curricula and instruction that engage students in an integrated use of the practices.
Core Ideas	Core ideas are the “big ideas” within each discipline under which the specific standards are organized.
Essential Questions	Essential questions are questions that are not answerable with an easy answer or a simple instruction. The purpose of essential questions is to provide opportunities for inquiry into the learning and act as an umbrella to anchor the unit/lesson.
Resources/ Instructional Tools	Resources identified in Curriculum Guides are not intended to be exhaustive, nor are they intended to be prescriptive. The resources identified may function as a menu of curriculum resources from which educators identify the most appropriate tools to utilized in their classrooms. More specifics about identified resources are identified within the curriculum map documents.