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Science Curriculum Guide — Grade 2

Theme: Wholes and Parts

In Second Grade, student scientists…

- look beyond structures of individual plants and animals and look to the environment in which organisms live.
- learn that water is found everywhere on Earth and takes different forms and shapes.
- map landforms and bodies of water and observe how flowing water and wind shape landforms.
- classify materials based on similar properties and functions.
- test different materials to collect and analyze data to determine which materials are best for a specific function.
- construct large objects from smaller pieces and, conversely, learn when materials are cut into small pieces they still exist as the same material.

MA Department of Education STE Curriculum Frameworks, 2016

Second Grade Content Standards

Earth and Space Science

- Earth's Systems

Life Science

- Ecosystems: Interactions, Energy, and Dynamics
- Biological Evolution: Unity and Diversity

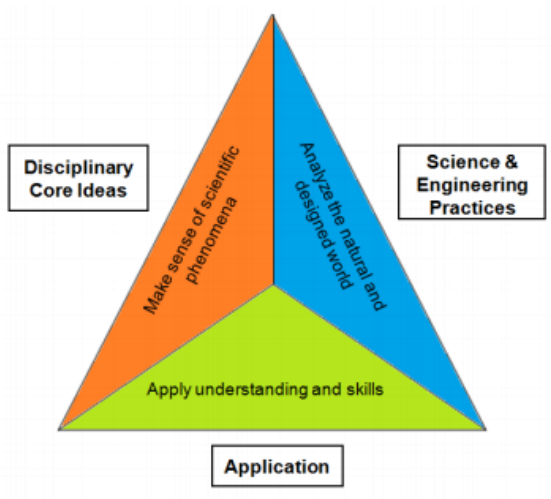
Physical Science

- Matter and Its Interactions
- Energy

Technology/Engineering

- Engineering Design

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 Systems	• What impact do wind and water have on the shape of the land? • What are the different shapes and types of landforms on Earth's surface? • Where could water be on Earth?	*What is the World Made of?* read aloud *Erosion Changing Earth's Surface* read aloud *Follow the Water from Brook to Ocean* read aloud Matter All Around Us Unit A Changing Planet Unit Land and Water Unit *Know Atom lesson: Earth Events*
Life Science: Ecosystems: Interactions, Energy, and Dynamics	• How do animals and plants depend on their surroundings?	*The ABCs of Habitats* read aloud *How do Apples Grow* read aloud *A Butterfly's Life* read aloud *Animals at Home* read aloud Living Earth Unit Growing Plants Unit Plant and Animal Relationships Unit Engineering Homes Unit *Know Atom lesson: Butterfly Life Cycle*
Life Science: Biological Evolution: Unity and Diversity	• How are living things in an area similar? • How are living things different in different areas? • Why might these similarities and differences exist?	*The ABCs of Habitats* read aloud Living Earth Unit
Physical Science: Matter and its Interactions	• How can you use properties of materials to classify and organize them? • What material properties match useful purposes? • What is the impact of breaking an item into smaller units? • How does cooling and heating impact materials?	*Forces Make Things Move* read aloud *What Floats? What Sinks? A Look at Density* read aloud Engineering Homes Unit Action & Reactions Unit Balancing Boats Unit *Know Atom lesson: Floating and Sinking*
Physical Science: Energy	• What is the impact of friction on temperature and speed?	*Forces Make Things Move* read aloud Action & Reactions Unit
Technology/Engineering Engineering Design	• How can you decide the strengths and weaknesses of an object's performance in solving a problem?	*Animals at Home* read aloud Engineering Homes Unit

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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.