Middle School Grade 7 Science Tutorials offer targeted instruction, practice, and review designed to help students develop scientific literacy, deepen conceptual understanding, and apply scientific practices. Students explore concepts such as how energy can be transferred and transformed, the conservation of mass and energy, the cycles and patterns of Earth and the Moon, and the cycles of matter and flow of energy through living systems.

Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By continually honing their ability to apply knowledge in real-world scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students as they explore the nature of science through focused content, interactive mini investigations, multi-modal representations, and personalized feedback. The Review It offers a high-impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

These Tutorials are built to the Next Generation Science Standards for middle school science.

Unit 1: Nature of Science

- **WHAT IS SCIENCE?**
- **TYPES OF INVESTIGATIONS**
- **USING MODELS**

Unit 2: Measurement and Data

- **TOOLS AND MEASUREMENT**
- **DISPLAYING AND INTERPRETING DATA**

Unit 3: Nature of Matter

- **WHAT IS MATTER?**
  - MS-PS1-1: Matter and Its Interactions Develop models to describe the atomic composition of simple molecules and extended structures.
- **ATOMIC STRUCTURE**
  - MS-PS1-1: Matter and Its Interactions Develop models to describe the atomic composition of simple molecules and extended structures.

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- **THE PERIODIC TABLE**
  - MS-PS1-2: Matter and Its Interactions Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Unit 4: Describing Matter

- **PROPERTIES OF MATTER**
  - MS-PS1-2: Matter and Its Interactions Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- **SOLIDS, LIQUIDS, AND GASES**
  - MS-PS1-1: Matter and Its Interactions Develop models to describe the atomic composition of simple molecules and extended structures.
- **MIXTURES OF MATTER**
  - MS-PS1-2: Matter and Its Interactions Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
  - MS-PS1-3: Matter and Its Interactions Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

Unit 5: Changes in Matter

- **PHYSICAL AND CHEMICAL CHANGES**
  - MS-PS1-2: Matter and Its Interactions Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- **CHANGES OF STATE**
  - MS-PS1-4: Matter and Its Interactions Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
- **CHEMICAL EQUATIONS**
  - MS-PS1-5: Matter and Its Interactions Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

Unit 6: Planet Earth

- **MODELS OF EARTH**
  - MS-ESS1-2: Earths Place in the Universe Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- **EARTH'S STRUCTURE AND CYCLES**
  - MS-ESS2-1: Earths Systems Develop a model to describe the cycling of Earths materials and the flow of energy that drives this process.

Unit 7: The Geosphere

- **MINERALS**

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- MS-ESS2-1: Earths Systems Develop a model to describe the cycling of Earths materials and the flow of energy that drives this process.
- MS-ESS3-1: Earth and Human Activity Construct a scientific explanation based on evidence for how the uneven distributions of Earths mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- MS-ESS3-4: Earth and Human Activity Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earths systems.

- **THE ROCK CYCLE**
  - MS-ESS2-1: Earths Systems Develop a model to describe the cycling of Earths materials and the flow of energy that drives this process.
- **SOIL**
  - MS-ESS3-1: Earth and Human Activity Construct a scientific explanation based on evidence for how the uneven distributions of Earths mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Unit 8: Our Changing Planet

- **DEFORMING EARTH'S CRUST**
  - MS-ESS2-2: Earths Systems Construct an explanation based on evidence for how geoscience processes have changed Earths surface at varying time and spatial scales.
  - MS-ESS3-1: Earth and Human Activity Construct a scientific explanation based on evidence for how the uneven distributions of Earths mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- **WEATHERING AND EROSION**
  - MS-ESS2-2: Earths Systems Construct an explanation based on evidence for how geoscience processes have changed Earths surface at varying time and spatial scales.
  - MS-ESS3-1: Earth and Human Activity Construct a scientific explanation based on evidence for how the uneven distributions of Earths mineral, energy, and groundwater resources are the result of past and current geoscience processes.
  - MS-ESS3-2: Earth and Human Activity Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- **GEOLOGIC TIME**
  - MS-ESS1-4: Earths Place in the Universe Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earths 4.6-billion-year-old history.

Unit 9: Earth's Plates

- **PLATE TECTONICS**

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- MS-ESS2-2: Earths Systems Construct an explanation based on evidence for how geoscience processes have changed Earths surface at varying time and spatial scales.
- MS-ESS2-3: Earths Systems Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

- **EARTHQUAKES AND VOLCANOES**
  - MS-ESS2-2: Earths Systems Construct an explanation based on evidence for how geoscience processes have changed Earths surface at varying time and spatial scales.
  - MS-ESS3-2: Earth and Human Activity Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
  - MS-ESS2-2: Earths Systems Construct an explanation based on evidence for how geoscience processes have changed Earths surface at varying time and spatial scales.

Unit 10: Life on Earth

- **CHEMISTRY OF LIFE**
  - MS-LS1-6: From Molecules to Organisms: Structures and Processes Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
  - MS-LS1-7: From Molecules to Organisms: Structures and Processes Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- **CELL NUTRITION AND TRANSPORT**
  - MS-LS1-2: From Molecules to Organisms: Structures and Processes Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.

Unit 11: Ecology

- **CHARACTERISTICS OF ECOSYSTEMS**
  - MS-LS2-1: Ecosystems: Interactions, Energy, and Dynamics Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- **INTERACTIONS IN ECOSYSTEMS**
  - MS-LS1-6: From Molecules to Organisms: Structures and Processes Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
  - MS-LS2-2: Ecosystems: Interactions, Energy, and Dynamics Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
  - MS-LS2-3: Ecosystems: Interactions, Energy, and Dynamics Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- **SUCCESSION AND ECOSYSTEM STABILITY**

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- MS-LS2-4: Ecosystems: Interactions, Energy, and Dynamics Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- MS-LS2-5: Ecosystems: Interactions, Energy, and Dynamics Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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