Middle School Grade 6 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 the composition of Earth's lithosphere, modern cell theory, the nature of matter, and the comparison of kinetic and potential energy.

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: Energy

- **DESCRIBING ENERGY**
  - MS-PS3-1: Energy Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
- **ENERGY TRANSFER AND TRANSFORMATION**
  - MS-PS3-2: Energy Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

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- MS-PS3-5: Energy Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

Unit 4: Thermal Energy

- **THERMAL ENERGY AND TEMPERATURE**
  - MS-PS3-4: Energy Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- **HEAT AND THERMAL ENERGY**
  - MS-PS3-4: Energy Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- **ENERGY TRANSFER AND TECHNOLOGY**
  - MS-PS1-6: Matter and Its Interactions Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.
  - MS-PS3-3: Energy Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

Unit 5: Thermal Energy and Earth Systems

- **FRESHWATER AND ICE**
  - 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-ESS2-4: Earths Systems Develop a model to describe the cycling of water through Earths systems driven by energy from the sun and the force of gravity.
- **OCEANS**
  - MS-ESS2-6: Earths Systems Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
- **THE ATMOSPHERE**
  - MS-ESS2-6: Earths Systems Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

Unit 6: Weather and Climate

- **WEATHER**
  - MS-ESS2-5: Earths Systems Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
- **SEVERE WEATHER**
  - 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.

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- **CLIMATE**
  - MS-ESS2-6: Earths Systems Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
  - MS-ESS3-5: Earth and Human Activity Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Unit 7: Humans and Earth's Resources

- **NATURAL RESOURCES**
  - 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.
- **IMPACTS OF HUMANS**
  - 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.
  - MS-ESS3-5: Earth and Human Activity Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
  - MS-ESS3-3: Earth and Human Activity Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
  - 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.

Unit 8: Nature of Life

- **CHARACTERISTICS OF LIFE**
  - MS-LS1-1: From Molecules to Organisms: Structures and Processes Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
  - MS-LS1-5: From Molecules to Organisms: Structures and Processes Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- **DOMAINS AND KINGDOMS OF LIFE**
  - MS-LS1-1: From Molecules to Organisms: Structures and Processes Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
  - MS-LS1-4: From Molecules to Organisms: Structures and Processes Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

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- 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.

- **PATTERNS OF REPRODUCTION**
  - MS-LS3-2: Heredity: Inheritance and Variation of Traits Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

Unit 9: Cells

- **CELL STRUCTURE**
  - MS-LS1-1: From Molecules to Organisms: Structures and Processes Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
  - 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.
- **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 10: Multicellular Bodies

- **SPECIALIZED CELLS AND TISSUES**
  - MS-LS1-3: From Molecules to Organisms: Structures and Processes Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- **ORGANS AND BODY SYSTEMS**
  - MS-LS1-3: From Molecules to Organisms: Structures and Processes Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Unit 11: The Human Body

- **HUMAN ORGAN SYSTEMS**
  - MS-LS1-3: From Molecules to Organisms: Structures and Processes Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
  - MS-LS1-8: From Molecules to Organisms: Structures and Processes Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
- **DISEASE AND HUMAN HEALTH**
  - MS-LS1-1: From Molecules to Organisms: Structures and Processes Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Unit 12: Response to Stimuli

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- **ANIMAL BEHAVIORS**
  - MS-LS1-4: From Molecules to Organisms: Structures and Processes Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
  - MS-LS1-8: From Molecules to Organisms: Structures and Processes Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
- **PLANT RESPONSES**
  - MS-LS1-4: From Molecules to Organisms: Structures and Processes Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

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