

Science Tutorials offer targeted instruction, practice, and review designed to help students develop scientific literacy, deepen conceptual understanding, and apply scientific practices. 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 state standards.

Unit 1: The 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 Life

- **CHARACTERISTICS OF LIFE**
- **CHEMISTRY OF LIFE**
 - NCES.6.L.2.1: Ecosystems Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment. Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within food chains and food webs (terrestrial and aquatic) from producers to consumers to decomposers.
 - NCES.6.L.1.2: Structures and Functions of Living Organisms Understand the structures, processes and behaviors of plants that enable them to survive and reproduce. Explain the significance of the processes of photosynthesis, respiration, and transpiration to the survival of green plants and other organisms.

Unit 4: Matter

- **WHAT IS MATTER?**

- NCES.6.P.2.1: Matter: Properties and Change Understand the structure, classifications and physical properties of matter. Recognize that all matter is made up of atoms and atoms of the same element are all alike, but are different from the atoms of other elements.

- **PROPERTIES OF MATTER**

- NCES.6.P.2.3: Matter: Properties and Change Understand the structure, classifications and physical properties of matter. Compare the physical properties of pure substances that are independent of the amount of matter present including density, melting point, boiling point, and solubility to properties that are dependent on the amount of matter present to include volume, mass and weight.

- **CHANGES OF STATE**

- NCES.6.P.2.2: Matter: Properties and Change Understand the structure, classifications and physical properties of matter. Explain the effect of heat on the motion of atoms through a description of what happens to particles during a change in phase.

Unit 5: Thermal Energy and Heat

- **HEAT AND THERMAL ENERGY**

- NCES.6.P.3.1: Energy: Conservation and Transfer Understand characteristics of energy transfer and interactions of matter and energy. Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result.
- NCES.6.E.1.2: Earth in the Universe Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe. Explain why Earth sustains life while other planets do not based on their properties (including types of surface, atmosphere and gravitational force) and location to the Sun.

- **ENERGY TRANSFER AND TECHNOLOGY**

- NCES.6.P.3.3: Energy: Conservation and Transfer Understand characteristics of energy transfer and interactions of matter and energy. Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).

Unit 6: Waves

- **MECHANICAL WAVES**

- NCES.6.P.1.1: Forces and Motion Understand the properties of waves and the wavelike property of energy in earthquakes, light and sound waves. Compare the properties of waves to the wavelike property of energy in earthquakes, light and sound.
- NCES.6.P.1.3: Forces and Motion Understand the properties of waves and the wavelike property of energy in earthquakes, light and sound waves. Explain the relationship among the rate of vibration, the medium through which vibrations travel, sound and hearing.

- **ELECTROMAGNETIC WAVES**

- NCES.6.P.1.1: Forces and Motion Understand the properties of waves and the wavelike property of energy in earthquakes, light and sound waves. Compare the properties of waves to the wavelike property of energy in earthquakes, light and sound.
- NCES.6.P.1.2: Forces and Motion Understand the properties of waves and the wavelike property of energy in earthquakes, light and sound waves. Explain the relationship among visible light, the electromagnetic spectrum, and sight.

- **INTERACTIONS OF WAVES AND MATTER**

- NCES.6.P.3.2: Energy: Conservation and Transfer Understand characteristics of energy transfer and interactions of matter and energy. Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature.
- NCES.6.P.1.3: Forces and Motion Understand the properties of waves and the wavelike property of energy in earthquakes, light and sound waves. Explain the relationship among the rate of vibration, the medium through which vibrations travel, sound and hearing.

Unit 7: Planet Earth and Human Impact

- **EARTH'S STRUCTURE AND CYCLES**

- NCES.6.E.2.1: Earth Systems, Structures and Processes Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans. Summarize the structure of the earth, including the layers, the mantle and core based on the relative position, composition and density.

- **SOIL**

- NCES.6.E.2.3: Earth Systems, Structures and Processes Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans. Explain how the formation of soil is related to the parent rock type and the environment in which it develops.
- NCES.6.E.2.4: Earth Systems, Structures and Processes Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans. Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship.

- **IMPACTS OF HUMANS**

- NCES.6.E.2.4: Earth Systems, Structures and Processes Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans. Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship.

Unit 8: Earth's Plates

- **PLATE TECTONICS**

- NCES.6.E.2.2: Earth Systems, Structures and Processes Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans. Explain how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow and volcanoes to reflect forces within the earth.

- **EARTHQUAKES AND VOLCANOES**

- NCES.6.E.2.2: Earth Systems, Structures and Processes Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans. Explain how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow and volcanoes to reflect forces within the earth.

Unit 9: The Solar System and Exploration

- **SUN-EARTH-MOON SYSTEM**

- NCES.6.E.1.1: Earth in the Universe Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe. Explain how the relative motion and relative position of the sun, Earth and moon affect the seasons, tides, phases of the moon, and eclipses.

- **OUR SOLAR SYSTEM**

- NCES.6.E.1.2: Earth in the Universe Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe. Explain why Earth sustains life while other planets do not based on their properties (including types of surface, atmosphere and gravitational force) and location to the Sun.

- **SPACE EXPLORATION**

- NCES.6.E.1.3: Earth in the Universe Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe. Summarize space exploration and the understandings gained from them.

Unit 10: Multicellular Bodies and Reproduction

- **ORGANS AND ORGAN SYSTEMS**

- NCES.6.L.1.1: Structures and Functions of Living Organisms Understand the structures, processes and behaviors of plants that enable them to survive and reproduce. Summarize the basic structures and functions of flowering plants required for survival, reproduction and defense.

- **PATTERNS OF REPRODUCTION**

- NCES.6.L.1.1: Structures and Functions of Living Organisms Understand the structures, processes and behaviors of plants that enable them to survive and reproduce. Summarize the basic structures and functions of flowering plants required for survival, reproduction and defense.

Unit 11: Response to Stimuli**• ANIMAL BEHAVIOR**

- NCES.6.L.2.3: Ecosystems Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment. Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.

• PLANT RESPONSES

- NCES.6.L.2.2: Ecosystems Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment. Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an environment.
- NCES.6.L.2.3: Ecosystems Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment. Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.

Unit 12: Ecology**• CHARACTERISTICS OF ECOSYSTEMS**

- NCES.6.L.2.3: Ecosystems Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment. Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.

• INTERACTIONS IN ECOSYSTEMS

- NCES.6.L.2.1: Ecosystems Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment. Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within food chains and food webs (terrestrial and aquatic) from producers to consumers to decomposers.