

Tennessee 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.

Unit 1: Energy and Waves

- **ENERGY TRANSFER AND TRANSFORMATION**

- 6.PS3.1: Analyze the sources of energy in a system to gather evidence supporting that energy is conserved during transfers of kinetic, potential (elastic, gravitational, and chemical), and/or thermal energy.

- **MECHANICAL WAVES**

- 6.PS3.2: Use a model to gather evidence to support changes to a system can be caused by transfers of sound or thermal energy (i.e., conduction, convection, or radiation).

Unit 2: Thermal Energy

- **HEAT AND THERMAL ENERGY**

- 6.PS3.2: Use a model to gather evidence to support changes to a system can be caused by transfers of sound or thermal energy (i.e., conduction, convection, or radiation).

- **ENERGY TRANSFER AND TECHNOLOGY**

- 6.PS3.1: Analyze the sources of energy in a system to gather evidence supporting that energy is conserved during transfers of kinetic, potential (elastic, gravitational, and chemical), and/or thermal energy.
- 6.PS3.2: Use a model to gather evidence to support changes to a system can be caused by transfers of sound or thermal energy (i.e., conduction, convection, or radiation).
- 6.ETS1.2: Design, construct, and test a device that either minimizes or maximizes thermal energy transfer by combining solutions or parts of solutions to solve a problem that can be communicated and explained to others.

Unit 3: Thermal Energy and Earth's Systems

- **FRESHWATER AND ICE**

- 6.ESS2.4: Develop and use a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

- **OCEANS**

- 6.ESS2.1: Diagram oceanic and atmospheric convection patterns in a system that flow due to uneven heating of the earth.
- 6.ESS2.2: Gather evidence to justify that oceanic convection currents in a system are caused by the sun's transfer of thermal energy and differences in salinity leading to global water movement.
- 6.ESS2.4: Develop and use a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

- **THE ATMOSPHERE**

- 6.ESS2.1: Diagram oceanic and atmospheric convection patterns in a system that flow due to uneven heating of the earth.
- 6.ESS2.4: Develop and use a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- 6.ESS2.6: Develop a model to explain the role of greenhouse gases in regulating the Earth's average surface temperature and keeping it habitable.

Unit 4: Weather and Climate

- **WEATHER**

- 6.ESS2.7: Collect data to provide evidence for how the interactions of air masses result in changes in local weather conditions and how that data can be used to predict probable local weather patterns.

- **CLIMATE**

- 6.ESS2.1: Diagram oceanic and atmospheric convection patterns in a system that flow due to uneven heating of the earth.
- 6.ESS2.3: Construct an explanation for how atmospheric flow, geographic features, and ocean currents affect the climate of a region through heat transfer.

Unit 5: Ecology

- **CHARACTERISTICS OF ECOSYSTEMS**

- 6.LS2.1: Use data to evaluate and communicate the impact of environmental variables, both living and nonliving (e.g., food, water, oxygen, and other resources), on population size within a system.

- **INTERACTIONS IN ECOSYSTEMS**

- 6.LS2.2: Construct an explanation that predicts patterns of competitive, symbiotic, and predatory interactions among organisms across ecosystems.

- 6.LS2.3: Use a model to construct an explanation about the transfer of energy through a food web and energy pyramid in an ecosystem.
- **SUCCESSION AND ECOSYSTEM STABILITY**
 - 6.LS2.1: Use data to evaluate and communicate the impact of environmental variables, both living and nonliving (e.g., food, water, oxygen, and other resources), on population size within a system.
 - 6.LS2.4: Construct an explanation that uses abiotic (e.g., precipitation, temperature, soil) and biotic (e.g., biodiversity, number of organisms) patterns in earth's terrestrial and aquatic ecosystems (e.g., tundra, taiga, deciduous forest, desert, grasslands, rainforest, marine, and freshwater) as measures of ecosystem health.
 - 6.LS2.5: Analyze existing evidence about the effect of a specific invasive species on native populations in Tennessee and design a solution to mitigate its impact.
 - 6.LS4.1: Explain how changes to biodiversity in a system would impact human resources (e.g., food, medicine, and clean water) and ecosystem services (e.g., climate stabilization, decomposition of waste, and pollination).
 - 6.ESS2.5: Analyze and interpret data to determine the impact of humans and other organisms on the water cycle, landforms (e.g., rain shadow effect) and atmospheric systems.
 - 6.ESS3.3: Obtain, evaluate, and communicate information about the impacts of human activities on the biosphere including conservation, habitat management, species endangerment, and extinction.
 - 6.ETS1.1: Design, evaluate, and improve a possible solution for maintaining biodiversity of ecosystems.

Unit 6: Humans and Earth's Resources

- **NATURAL RESOURCES**
 - 6.ESS3.1: Use data to explain the consumption and sustainability of natural resources (non-renewable and renewable) and the resulting impact on Earth's system.
 - 6.ESS3.2: Investigate and compare existing and developing technologies that utilize renewable and alternative energy resources.
- **IMPACTS OF HUMANS**
 - 6.LS4.1: Explain how changes to biodiversity in a system would impact human resources (e.g., food, medicine, and clean water) and ecosystem services (e.g., climate stabilization, decomposition of waste, and pollination).
 - 6.ESS2.5: Analyze and interpret data to determine the impact of humans and other organisms on the water cycle, landforms (e.g., rain shadow effect) and atmospheric systems.
 - 6.ESS3.1: Use data to explain the consumption and sustainability of natural resources (non-renewable and renewable) and the resulting impact on Earth's system.
 - 6.ESS3.3: Obtain, evaluate, and communicate information about the impacts of human activities on the biosphere including conservation, habitat management, species endangerment, and extinction.