

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.

1. THE NATURE OF SCIENCE

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

2. MEASUREMENT AND DATA

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

3. NATURE OF MATTER

- **WHAT IS MATTER?**
 - **NCES.8.P.1.1** *Classify matter as elements, compounds, or mixtures based on how the atoms are packed together in arrangements.*
 - **NCES.8.P.1.2** *Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of elements.*
- **ATOMIC STRUCTURE**
 - **NCES.8.P.1.2** *Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of elements.*
- **THE PERIODIC TABLE**
 - **NCES.8.P.1.2** *Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of elements.*

4. PROPERTIES AND CHANGES IN MATTER

- **PROPERTIES OF MATTER**
 - **NCES.8.P.1.3** *Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.*

- **PHYSICAL AND CHEMICAL CHANGES**

- **NCES.8.P.1.3** Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.

- **CHEMICAL EQUATIONS**

- **NCES.8.P.1.4** Explain how the idea of atoms and a balanced chemical equation support the law of conservation of mass.

5. THE HYDROSPHERE AND CRYOSPHERE

- **FRESHWATER AND ICE**

- **NCES.8.E.1.1.a** Water distribution on earth
- **NCES.8.E.1.1.b** Local river basins and water availability

- **OCEANS**

- **NCES.8.E.1.2.a** Estuaries
- **NCES.8.E.1.2.b** Marine ecosystems
- **NCES.8.E.1.2.c** Upwelling
- **NCES.8.E.1.2.d** Behavior of gases in the marine environment
- **NCES.8.E.1.2.f** Deep ocean technology and understandings gained
- **NCES.8.E.1.2.e** Value and sustainability of marine resources

6. NATURE OF LIFE, TIME, AND HUMAN IMPACT

- **CHEMISTRY OF LIFE**

- **NCES.8.L.5.2** Explain the relationship among a healthy diet, exercise, and the general health of the body (emphasis on the relationship between respiration and digestion).

- **GEOLOGIC TIME**

- **NCES.8.E.2.2** Explain the use of fossils, ice cores, composition of sedimentary rocks, faults, and igneous rock formations found in rock layers as evidence of the history of the Earth and its changing life forms.
- **NCES.8.E.2.1** Infer the age of Earth and relative age of rocks and fossils from index fossils and ordering of rock layers (relative dating and radioactive dating).

- **IMPACTS OF HUMANS**

- **NCES.8.P.2.1** Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy.
- **NCES.8.P.2.2** Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation.
- **NCES.8.E.1.3.b** Dissolved oxygen
- **NCES.8.E.1.3.c** pH
- **NCES.8.E.1.3.d** Nitrates and phosphates
- **NCES.8.E.1.3.e** Turbidity
- **NCES.8.E.1.3.f** Bio-indicators
- **NCES.8.E.1.4.a** Monitoring of the hydrosphere
- **NCES.8.E.1.4.b** Water quality standards
- **NCES.8.E.1.4.c** Methods of water treatment
- **NCES.8.E.1.4.d** Maintaining safe water quality
- **NCES.8.E.1.4.e** Stewardship

7. GENETICS AND THE HUMAN BODY

- **BIOTECHNOLOGY**

- **NCES.8.L.2.1.a** *Specific genetic information available*
- **NCES.8.L.2.1.e** *Implications for agriculture*
- **NCES.8.L.2.1.b** *Careers*
- **NCES.8.L.2.1.c** *Economic benefits to North Carolina*
- **NCES.8.L.2.1.d** *Ethical issues*

- **DISEASE AND HUMAN HEALTH**

- **NCES.8.L.1.1** *Summarize the basic characteristics of viruses, bacteria, fungi and parasites relating to the spread, treatment and prevention of disease.*
- **NCES.8.L.1.2** *Explain the difference between epidemic and pandemic as it relates to the spread, treatment and prevention of disease.*

8. ECOLOGY

- **CHARACTERISTICS OF ECOSYSTEMS**

- **NCES.8.L.3.1** *Explain how factors such as food, water, shelter and space affect populations in an ecosystem.*

- **INTERACTIONS IN ECOSYSTEMS**

- **NCES.8.L.3.2.a** *Coexistence and cooperation*
- **NCES.8.L.3.2.b** *Competition (predator/prey)*
- **NCES.8.L.3.2.c** *Parasitism*
- **NCES.8.L.3.2.d** *Mutualism*
- **NCES.8.L.3.1** *Explain how factors such as food, water, shelter and space affect populations in an ecosystem.*
- **NCES.8.L.3.3** *Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide and oxygen).*
- **NCES.8.L.5.1** *Summarize how food provides the energy and the molecules required for building materials, growth and survival of all organisms (to include plants).*
- **NCES.8.L.5.2** *Explain the relationship among a healthy diet, exercise, and the general health of the body (emphasis on the relationship between respiration and digestion).*

- **SUCCESSION AND ECOSYSTEM STABILITY**

- **NCES.8.L.3.1** *Explain how factors such as food, water, shelter and space affect populations in an ecosystem.*

9. EVOLUTION

- **THEORY OF EVOLUTION**

- **NCES.8.E.2.2** *Explain the use of fossils, ice cores, composition of sedimentary rocks, faults, and igneous rock formations found in rock layers as evidence of the history of the Earth and its changing life forms.*
- **NCES.8.L.4.1** *Summarize the use of evidence drawn from geology, fossils, and comparative anatomy to form the basis for biological classification systems and the theory of evolution.*

- **NATURAL SELECTION**

- **NCES.8.L.4.2** *Explain the relationship between genetic variation and an organism's ability to adapt to its environment.*