



## NC Science Essential Standards

### 8<sup>th</sup> Grade



#### Matter: Properties and Change

##### **8.P.1 Understand the properties of matter and changes that occur when matter interacts in an open and closed container.**

- 8.P.1.1 Classify matter as elements, compounds, or mixtures based on how the atoms are packed together in arrangements.
- 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.
- 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.
- 8.P.1.4 Explain how the idea of atoms and a balanced chemical equation support the law of conservation of mass.

#### Energy: Conservation and Transfer

##### **8.P.2 Explain the environmental implications associated with the various methods of obtaining, managing, and using energy resources.**

- 8.P.2.1 Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy.
- 8.P.2.2 Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation.

#### Earth Systems, Structures and Processes

##### **8.E.1 Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.**

- 8.E.1.1 Explain the structure of the hydrosphere including:
- Water distribution on earth
  - Local river basins and water availability
- 8.E.1.2 Summarize evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms:
- Estuaries
  - Marine ecosystems
  - Upwelling
  - Behavior of gases in the marine environment
  - Deep ocean technology and understandings gained
- 8.E.1.3 Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including:
- Temperature
  - Dissolved oxygen
  - pH
  - Nitrates and phosphates
  - Turbidity
  - Bio-indicators
- 8.E.1.4 Conclude that the good health of humans requires:
- Monitoring of the hydrosphere
  - Water quality standards
  - Methods of water treatment
  - Maintaining safe water quality
  - Stewardship

#### Earth History

##### **8.E.2 Understand the history of Earth and its life forms based on evidence of change recorded in fossil records and landforms.**

- 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).

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.

### **Structures and Functions of Living Organisms**

#### **8.L.1 Understand the hazards caused by agents of diseases that effect living organisms.**

8.L.1.1 Summarize the basic characteristics of viruses, bacteria, fungi and parasites relating to the spread, treatment and prevention of disease.

8.L.1.2 Explain the difference between epidemic and pandemic as it relates to the spread, treatment and prevention of disease.

#### **8.L.2 Understand how biotechnology is used to affect living organisms.**

8.L.2.1 Summarize aspects of biotechnology including:

- Specific genetic information available
- Careers
- Economic benefits to North Carolina
- Ethical issues
- Implications for agriculture

### **Ecosystems**

#### **8.L.3 Understand how organisms interact with and respond to the biotic and abiotic components of their environment.**

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

8.L.3.2 Summarize the relationships among producers, consumers, and decomposers including the positive and negative consequences of such interactions including:

- Coexistence and cooperation
- Competition (predator/prey)
- Parasitism
- Mutualism

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).

### **Evolution and Genetics**

#### **8.L.4 Understand the evolution of organisms and landforms based on evidence, theories and processes that impact the Earth over time.**

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.

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

### **Molecular Biology**

#### **8.L.5 Understand the composition of various substances as it relates to their ability to serve as a source of energy and building materials for growth and repair of organisms.**

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).

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).