

## Grade 8

It is essential that these standards be addressed in contexts that promote scientific inquiry, use of evidence, critical thinking, making connections, and communication.

### 8.1 Structure and Function: **Systems and their components function at various levels of complexity.**

- 8.1P.1 Describe the atomic model and explain how the types and arrangements of atoms determine the physical and chemical properties of elements and compounds.
- 8.1P.2 Explain how the Periodic Table is an organization of elements based on their physical and chemical properties.
- 8.1P.3 Explain how the motion and spacing of particles determines states of matter.
- 8.1L.1 Explain how genetics and anatomical characteristics are used to classify organisms and infer evolutionary relationships.

### 8.2 Interaction and Change: **Systems interact with other systems.**

- 8.2P.1 Compare and contrast physical and chemical changes and describe how the law of conservation of mass applies to these changes.
- 8.2P.2 Explain how energy is transferred, transformed, and conserved.
- 8.2L.1 Explain how species change through the process of natural selection. Describe evidence for evolution.
- 8.2E.1 Explain how gravity is the force that keeps objects in the solar system in regular and predictable motion and describe the resulting phenomena. Explain the interactions that result in Earth's seasons.
- 8.2E.2 Describe the processes of Earth's geosphere and the resulting major geological events.
- 8.2E.3 Explain the causes of patterns of atmospheric and oceanic movement and the effects on weather and climate.
- 8.2E.4 Analyze evidence for geologic, climatic, environmental, and life form changes over time.

### 8.3 Scientific Inquiry: **Scientific inquiry is the investigation of the natural world based on observations and science principles that includes proposing questions or hypotheses and designing procedures for questioning, collecting, analyzing, and interpreting multiple forms of accurate and relevant data to produce justifiable evidence-based explanations and new explorations.**

- 8.3S.1 Based on observations and science principles propose questions or hypotheses that can be examined through scientific investigation. Design and conduct a scientific investigation that uses appropriate tools, techniques, independent and dependent variables, and controls to collect relevant data.
- 8.3S.2 Organize, display, and analyze relevant data, construct an evidence-based explanation of the results of a scientific investigation, and communicate the conclusions including possible sources of error. Suggest new investigations based on analysis of results.
- 8.3S.3 Explain how scientific explanations and theories evolve as new information becomes available.

### 8.4 Engineering Design: **Engineering design is a process of identifying needs, defining problems, identifying design criteria and constraints, developing solutions, and evaluating proposed solutions.**

- 8.4D.1 Define a problem that addresses a need, and using relevant science principles investigate possible solutions given specified criteria, constraints, priorities, and trade-offs.
- 8.4D.2 Design, construct, and test a proposed engineering design solution and collect relevant data. Evaluate a proposed design solution in terms of design and performance criteria, constraints, priorities, and trade-offs. Identify possible design improvements.
- 8.4D.3 Explain how creating a new technology requires considering societal goals, costs, priorities, and trade-offs.