**Massachusetts Science and Technology/Engineering**

# Grade 4

Adopted 2016

## Earth and Space Sciences

### ESS1. Earth's Place in the Universe ESS1

4-ESS1-1. Use evidence from a given landscape that includes simple landforms and rock layers to support a claim about the role of erosion or deposition in the formation of the landscape over long periods of time. 4-ESS1-1

### ESS2. Earth's Systems ESS2

4-ESS2-1. Make observations and collect data to provide evidence that rocks, soils, and sediments are broken into smaller pieces through mechanical weathering and moved around through erosion by water, ice, wind, and vegetation. 4-ESS2-1

4-ESS2-2. Analyze and interpret maps of Earth's mountain ranges, deep ocean trenches, volcanoes, and earthquake epicenters to describe patterns of these features and their locations relative to boundaries between continents and oceans. 4-ESS2-2

### ESS3. Earth and Human Activity ESS3

4-ESS3-1. Obtain information to describe that energy and fuels humans use are derived from natural resources and that some energy and fuel sources are renewable and some are not. 4-ESS3-1

4-ESS3-2. Evaluate different solutions to reduce the impacts of a natural event such as an earthquake, blizzard, or flood on humans. 4-ESS3-2

## Life Science

### LS1. From Molecules to Organisms: Structures and Processes LS1

4-LS1-1. Construct an argument that animals and plants have internal and external structures that support their survival, growth, behavior, and reproduction. 4-LS1-1

## Physical Science

### PS3. Energy PS3

- 4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. 4-PS3-1
- 4-PS3-2. Make observations to show that energy can be transferred from place to place by sound, light, heat, and electric currents. 4-PS3-2
- 4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide. 4-PS3-3
- 4-PS3-4. Apply scientific principles of energy and motion to test and refine a device that converts kinetic energy to electrical energy or uses stored energy to cause motion or produce light or sound. 4-PS3-4

### PS4. Waves and Their Applications in Technologies for Information Transfer PS4

- 4-PS4-1. Develop a model of a simple mechanical wave (including sound) to communicate that waves (a) are regular patterns of motion along which energy travels, and (b) can cause objects to move. 4-PS4-1
- 4-PS4-2. Develop a model to describe that light must reflect off an object and enter the eye for the object to be seen. 4-PS4-2
- 4-PS4-3. Develop and compare multiple ways to transfer information through encoding, sending, receiving, and decoding a pattern. 4-PS4-3

## Technology/Engineering

### ETS1. Engineering Design ETS1

- 3-5-ETS1-3. Plan and carry out tests of one or more design features of a given model or prototype in which variables are controlled and failure points are considered to identify which features need to be improved. Apply the results of tests to redesign a model or prototype. 4.3-5-ETS1-3
- 3-5-ETS1-5(MA). Evaluate relevant design features that must be considered in building a model or prototype of a solution to a given design problem. 4.3-5-ETS1-5(MA)