

Grade 8 Science Massachusetts Standards

Earth and Space Science, Grades 6-8

Earth's Structure	
2	Describe the layers of the solid earth including the lithosphere, hot convecting mantle, and the dense metallic core.
Earth's History	
5	Describe how the movement of the earth's crustal plates causes both slow changes in the earth's surface (e.g., formation of mountains and ocean basins) and rapid ones (e.g., volcanic eruptions and earthquakes).
7	Explain and give examples of how physical evidence, such as fossils and surface features of glaciation, supports theories that the earth has evolved over geologic time.
The Earth in the Solar System	
8 *(Gr 6, 8)	Recognize that gravity is a force that pulls all things on earth toward the center of the earth. <i>Gravity plays a major role in the formation of the planets, stars, and solar system and in determining their motions.</i>
10	Compare and contrast properties and conditions of objects in the solar system (i.e., sun, planets, and moons) to those on earth (i.e., gravitational force, distance from the sun, speed, movement, temperature, and atmospheric conditions).
12	Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.

Life Science (Biology), Grades 6-8

Reproduction and Heredity	
7	Recognize that every organism requires a set of instructions that specifies its traits. These instructions are stored in the organism's chromosomes. Heredity is the passage of these instructions from one generation to another.
8	Recognize that heredity information is contained in genes located in the chromosomes of each cell. A human cell contains about 30,000 different genes on 23 different chromosomes.
9 *(Gr 7, 8)	<i>Compare asexual reproduction (offspring inherit half of their genes from each parent)</i> with asexual reproduction (offspring is an identical copy of the parent's cell).
Evolution and Biodiversity	
10	Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.
11	Recognize that evolution drawn from geology, fossils, and comparative anatomy provide the basis of the theory of evolution.
Changes in Ecosystems Over Time	
17	Identify ways in which ecosystems have changed throughout geologic time in response to physical conditions, interactions among organisms, and the actions of humans. Describe how changes may be catastrophes such as volcanic eruptions or ice storms.
18	Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.

Physical Sciences (Chemistry and Physics), Grades 6-8

Elements Compound and Mixtures	
5	Recognize that there are more than 100 elements that combine in a multitude of ways to produce compounds that make up all living things and nonliving that we encounter.
6	Differentiate between an atom (the smallest unit of an element that maintains the characteristics of that element) and a molecule (the smallest unit of a compound that maintains the characteristics of that compound).
7	Give basic examples of elements and compounds.
8	Differentiate between mixtures and pure substances.
9	Recognize that a substance (element or compound) has a melting and a boiling point, both of which are independent of the amount of the sample.
10	Differentiate between physical and chemical changes.

Inquiry and Experimentation

Grades 6-8	
Inquiry 1	Formulate a testable hypothesis.
Inquiry 2	Design and conduct an experiment specifying variables to be changed, controlled, and measured.
Inquiry 3	Select appropriate tools and technology (e.g., calculators, computers, thermometers, meter sticks, balances, graduated cylinders, and microscopes), and make quantitative observations.
Inquiry 4	Present and explain data and findings using multiple representations, including tables, graphs, mathematical and physical models, and demonstrations.
Inquiry 5	Draw conclusions based on data or evidence presented in tables or graphs, and make inferences based on patterns or trends in the data.
Inquiry 6	Communicate procedures and results using appropriate science and technology terminology.
Inquiry 7	Offer explanations of procedures, and critique and revise them.