

Grade 7 Science Massachusetts Standards

Earth and Space Science, Grades 6-8

Heat Transfers in the Earth System	
3	Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.
4	Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.
Earth's History	
6 *(Gr 6, 7)	Describe and give examples of ways in which the earth's surface is built up and torn down by natural processes, including deposition of sediments, rock formation , erosion, and weathering.

Life Science (Biology), Grades 6-8

Structure and Function of Cells	
3	Compare and contrast plants and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuole).
4	Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function is similar in all living organism.
Systems and Living Things	
5	Describe the hierarchal organization of multicellular organisms from cells to tissues to organs to systems to organisms.
6	Identify the general functions of the major system of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other.
Reproduction and Heredity	
9 *(Gr 7, 8)	Compare sexual reproduction (offspring inherit half of their genes from each parent) with asexual reproduction (offspring is an identical copy of the parent's cell)
Energy and Living Things	
16	Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used by other organisms.

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

Properties of Matter	
1 *(Gr 6, 7)	Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.
4	Explain and give examples of how mass is conserved in a closed system.
Motion of Objects	
11	Explain and give examples of how the motion of an object can be described by its position, direction of motion, and speed.
12	Graph and interpret distance vs. time graphs for constant speed.
Forms of Energy	
13	Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.
Heat Energy	
14	Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.
15	Explain the effect of heat on particle motion through a description of what happens to particles during a change in phase.
16	Give examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.

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.