

## Eighth Grade Science Content Standards and Objectives

<b>Standard 2:</b>	Nature of Science	
SC.S.8.1	<p>Students will</p> <ul style="list-style-type: none"> <li>• demonstrate an understanding of history and nature of science as a human endeavor encompassing the contributions of diverse cultures and scientists.</li> <li>• demonstrate the ability to use the inquiry process to solve problems.</li> </ul>	
<b>Objectives</b>	<b>Students will</b>	<b>PLT Activity and Page</b>
SC.O.8.1.01	formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.	#4 Sounds Around p. 26 #27 Every Tree for Itself p.117
SC.O.8.1.02	demonstrate how a testable methodology is employed to seek solutions for personal and societal issues. (e.g., “scientific method”).	#4 Sounds Around p. 26 #12 Invasive Species p. 59
SC.O.8.1.03	relate societal, cultural and economic issues to key scientific innovations.	
SC.O.8.1.04	conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).	#10 Charting Diversity p. 50 #11 Can It Be Real p. 54
SC.O.8.1.05	implement safe procedures and practices when manipulating equipment, materials, organisms, and models.	#23 The Fallen Log p.105 #48 Field, Forest and Stream p.203
SC.O.8.1.06	use appropriate technology solutions within a problem solving setting to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.	#4 Sounds Around p. 26 #12 Invasive Species p. 59 #48 Field, Forest and Stream p.203
SC.O.8.1.07	design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).	#4 Sounds Around p. 26 #12 Invasive Species p. 59

SC.O.8.1.08	draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).	#12 Invasive Species p. 59 #27 Every Tree for Itself p.117
<b>Standard 2: Content of Science</b>		
SC.S.8.2	Students will <ul style="list-style-type: none"> <li>demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives.</li> <li>demonstrate an understanding of the interrelationships among physics, chemistry, biology, earth/environmental science, and astronomy.</li> <li>apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.</li> </ul>	
<b>Objectives</b>	<b>Students will</b>	<b>PLT Activity and Page</b>
SC.O.8.2.01	demonstrate an understanding of the interrelationships among physics, chemistry, biology, earth/environmental science, and astronomy.	
SC.O.8.2.02	examine and describe the structures and functions of cell organelles.	#10 Charting Diversity p.51
SC.O.8.2.03	explain how the circulatory, respiratory and reproductive systems work together in the human body.	
SC.O.8.2.04	compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.	
SC.O.8.2.05	discuss how living cells obtain the essentials of life through chemical reactions of fermentation, respiration and photosynthesis.	#23 The Fallen Log p.105 #42 Sunlight & Shades of Green p.182 #48 Field, Forest and Stream p.203
SC.O.8.2.06	analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, or seed dispersal).	#26 Dynamic Duos p.113 #27 Every Tree for Itself p.117 #43 Have Seeds, Will Travel p.183 #66 Germinating Giants p.279
SC.O.8.2.07	demonstrate the basic principles of genetics; introduce Mendel's law, monohybrid crosses, production of body and sex cells (mitosis/meiosis), genes, chromosomes, and inherited traits.	#66 Germinating Giants p.279
SC.O.8.2.08	compare patterns of human development to other vertebrates.	
SC.O.8.2.09	organize groups of unknown organisms based on observable characteristics (e.g., create dichotomous keys).	#16 Pass the Plants, Please p. 77 #43 Have Seeds, Will Travel p.183 #68 Name that Tree p.288

SC.O.8.2.10	trace matter and energy flow in a food web as it flows from sunlight to producers and consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).	#23 The Fallen Log p.105 #27 Every Tree for Itself p.117 #42 Sunlight & Shades of Green p.182
SC.O.8.2.11	use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.	
SC.O.8.2.12	reconstruct development models of the atom (e.g., Crookes, Thompson, Becquerel, Rutherford, or Bohr).	
SC.O.8.2.13	calculate the number of protons, neutrons, and electrons and use the information to construct a Bohr model of the atom.	
SC.O.8.2.14	classify elements into their families based upon their valence electrons.	
SC.O.8.2.15	evaluate the variations in diffusion rates and examine the effect of changing temperatures.	
SC.O.8.2.16	conduct and classify chemical reactions by reaction type (e.g., synthesis, decomposition, single replacement or double replacement); energy type (e.g., endothermic and exothermic); and write word equations for the chemical reactions.	
SC.O.8.2.17	identify and describe factors that affect chemical reaction rates, including catalysts, temperature changes, light energies and particle size.	
SC.O.8.2.18	examine the various sources of energy (e.g., fossil fuels, wind, solar, geothermal, nuclear, biomass).	#14 Renewable or Not? p.69 #15 A Few of My Favorite Things p.75
SC.O.8.2.19	explain the Doppler effect (e.g., sound).	
SC.O.8.2.20	quantitatively represent wavelength, frequency and velocity (e.g., $v=\lambda f$ ).	#4 Sounds Around p. 26
SC.O.8.2.21	relate the conservation of energy theory to energy transformations (e.g., electrical/heat, or mechanical/heat).	
SC.O.8.2.22	quantitatively represent work, power, pressure (e.g., $Work=Force \times distance$ , $Power=Work/time$ , or $pressure=force/area$ ) from collected data.	
SC.O.8.2.23	graph and interpret the relationships of distance versus time, speed versus time, and acceleration versus time.	
SC.O.8.2.24	describe Newton's Laws of Motion; identify examples, illustrate qualitatively and quantitatively drawing vector examples.	
SC.O.8.2.25	illustrate and calculate the mechanical advantage of simple machines.	
SC.O.8.2.26	research and draw conclusions related to the quality and quantity of surface and ground water.	#14 Renewable or Not? p.69
SC.O.8.2.27	identify and explain the principle forces of plate tectonics and related geological events (e.g., earthquakes, volcanoes, or landforms).	
SC.O.8.2.28	determine the impact of oceans on weather and climate; relate global patterns of atmospheric movement on local weather.	#14 Renewable or Not? p. 69 #23 The Fallen Log p. 105

SC.O.8.2.29	analyze the forces of tectonics, weathering and erosion that have shaped the earth's surface.	#27 Every Tree for Itself p.117
SC.O.8.2.30	model processes of soil formation and suggest methods of soil preservation and conservation.	#27 Every Tree for Itself p.117
SC.O.8.2.31	research and recognize the societal concerns of exploration and colonization of space.	
SC.O.8.2.32	explain phenomena associated with motions in sun-earth-moon system (e.g., eclipses, tides, or seasons).	
SC.O.8.2.33	describe the origin and orbits of comets, asteroids, and meteoroids.	
<b>Standard 3:</b>	<b>Application of Science</b>	
SC.S.8.3	<p>Students will</p> <ul style="list-style-type: none"> <li>• demonstrate the ability to use inquiry process to explore systems, models, and changes.</li> <li>• demonstrate an understanding of the interdependence between science and technology.</li> <li>• demonstrate an understanding of the utilization of technology to gather data and communicate designs, results and conclusions.</li> <li>• demonstrate an understanding of personal and societal benefits of science, and an understanding of public policy decisions as related to health, population, resource and environmental issues.</li> </ul>	
<b>Objectives</b>	<b>Students will</b>	<b>PLT Activity and Page</b>
SC.O.8.3.01	synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).	#26 Dynamic Duos p.113 #27 Every Tree for Its elf p.117 #42 Sunlight & Shades of Green p.182
SC.O.8.3.02	investigate, compare and design scientific and technological solutions to personal and societal problems.	
SC.O.8.3.03	communicate experimental designs, results and conclusions using advanced technology tools.	
SC.O.8.3.04	collaborate to present research on current environmental and technological issues to predict possible solutions.	
SC.O.8.3.05	explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.	
SC.O.8.3.06	given a current science-technology-societal issue, construct and defend potential solutions.	