UTAH EDITION

Inspire Science

Teacher Edition

Mc Graw Hill

Correlations by Lesson to the UTAH Academic Standards for Science Grade 8

Standard 8.1.1 Develop a model to describe the scale and proportion of atoms and molecules. Emphasize developing atomic models of elements and their numbers of protons, neutrons, and electrons, as well as models of simple molecules. Topics like valence electrons, bond energy, ionic complexes, ions, and isotopes will be introduced at the high school level.	Student Edition: 2-17, 43-49 Investigations 4, 8, 10, 11, 43, 44, 46 Labs 5, 9, 42 STEM Project: Warm it Up! 64-66
Standard 8.1.2 Obtain information about various properties of matter, evaluate how different materials' properties allow them to be used for particular functions in society, and communicate your findings. Emphasize general properties of matter. Examples could include color, density, flammability, hardness, malleability, odor, ability to rust, solubility, state, or the ability to react with water.	Student Edition: 2-17, 18-37, 38-49, 70-81, 82-97 Encounter/Explain the Phenomenon 3, 19 Investigations 28, 86, 75, 77, 91 Labs 9, 21, 25, 30, 32-33, 41, 71-72 STEM Project: Warm it Up! 64-66, Take Cover 98-100
Standard 8.1.3 Plan and conduct an investigation and then analyze and interpret the data to identify patterns in changes in a substance's properties to determine whether a chemical reaction has occurred. Examples could include changes in properties such as color, density, flammability, odor, solubility, or state.	Student Edition: 29-37, 38-49, 50-63 Encounter/Explain the Phenomenon 39 Investigations 43, 46 Labs 30, 32-33, 41, 42, 54-55, 58-59 STEM Project: Warm it Up! 64-66
Standard 8.1.4 Obtain and evaluate information to describe how synthetic materials come from natural resources, what their functions are, and how society uses these new materials. Examples of synthetic materials could include medicine, foods, building materials, plastics, and alternative fuels.	Student Edition: 70-81, 82-97 Encounter/Explain the Phenomenon 71, 83 Investigations 75, 86, 88, 91, 92 Labs 71-72, 76, 77, 90 STEM Project: Take Cover 98-100
Standard 8.1.5 Develop a model that uses computational thinking to illustrate cause and effect relationships in particle motion, temperature, density, and state of a pure substance when heat energy is added or removed. Emphasize molecular-level models of solids, liquids, and gases to show how adding or removing heat energy can result in phase changes and focus on calculating the density of a substance's state.	Student Edition: 104-121, 122-137, 138-149, 150-163 Encounter/Explain the Phenomenon 105, 123, 139, 151 Investigations 108, 111, 113, 114, 126, 128, 132, 146 Labs 106, 116-117, 124-125, 141, 143, 145, 152, 154, 155, 159 STEM Project: Cookin' with the Sun 165-167
Standard 8.1.6 Develop a model to describe how the total number of atoms does not change in a chemical reaction, indicating that matter is conserved. Emphasize demonstrations of an understanding of the law of conservation of matter. Balancing equations and stoichiometry will be learned at the high school level.	Student Edition: 43-49, 50-63 Investigations 43, 44, 46 Labs 42 STEM Project: Warm it Up! 64-66 Teacher Edition: DIBL 56

Standard 8.1.7 Design, construct, and test a device that can affect the rate of a phase change. Compare and identify the best characteristics of competing devices and modify them based on data analysis to improve the device to better meet the criteria for success.	Student Edition: 122-137, 150- Encounter/Explain the Phenomenon Investigations 134 Labs 152, 154, 159 STEM Project: Cookin' with the Sun 165-167
Standard 8.2.1 Use computational thinking to analyze data about the relationship between the mass and speed of objects and the relative amount of kinetic energy of the objects. Emphasis should be on the quantity of mass and relative speed to the observable effects of the kinetic energy. Examples could include a full cart vs. an empty cart or rolling spheres with different masses down a ramp to measure the effects on stationary masses. Calculations of kinetic and potential energy will be learned at the high school level.	Student Edition: 173-181, 192-205 Encounter/Explain the Phenomenon 174, 191 Investigations 172 Labs 173, 176, 194, 199, 200 STEM Project: Energy at the Amusement Park 206-208
Standard 8.2.2 Ask questions about how the amount of potential energy varies as distance within the system changes. Plan and conduct an investigation to answer a question about potential energy. Emphasize comparing relative amounts of energy. Examples could include a cart at varying positions on a hill or an object being dropped from different heights. Calculations of kinetic and potential energy will be learned at the high school level.	Student Edition: 182-191, 192-205 Encounter/Explain the Phenomenon 183, 191 Investigations 187 Labs 184, 194-195, 199, 200 STEM Project: Energy at the Amusement Park 206-208
Standard 8.2.3 Engage in argument to identify the strongest evidence that supports the claim that the kinetic energy of an object changes as energy is transferred to or from the object. Examples could include observing temperature changes as a result of friction, applying force to an object, or releasing potential energy from an object.	Student Edition: 173-181, 192-205 Encounter/Explain the Phenomenon 174, 191 Investigations Labs 176, 194-195, 199, 200 STEM Project: Energy at the Amusement Park 206-208
Standard 8.2.4 Use computational thinking to describe a simple model for waves that shows the pattern of wave amplitude being related to wave energy. Emphasize describing waves with both quantitative and qualitative thinking. Examples could include using graphs, charts, computer simulations, or physical models to demonstrate amplitude and energy correlation	Student Edition: 212-233 Encounter/Explain the Phenomenon 213 Labs 214, 220, 224, 226-227, 230 STEM Project: Don't Make Waves 246-248
Standard 8.2.5 Develop and use a model to describe the structure of waves and how they are reflected, absorbed, or transmitted through various materials. Emphasize both light and mechanical waves. Examples could include drawings, simulations, and written descriptions of light waves through a prism; mechanical waves through gas vs. liquids vs. solids; or sound waves through different mediums.	Student Edition: 212-233, 234-245, 252-265, 266-279, 280-291, 292-305 Encounter/Explain the Phenomenon 213, 235, 253, 267, 291 Investigations 238, 259, 295-296 Labs 214, 220, 224, 226-227, 230, 234, 240, 241-242, 262, 269, 272, 275, 283, 286, 294, 297 STEM Project: Don't Make Waves 246-248, Optical Illusions 306-308

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Standard 8.2.6 Obtain and evaluate information to communicate the claim that the structure of digital signals are a more reliable way to store or transmit information than analog signals. Emphasize the basic understanding that waves can be used for communication purposes. Examples could include using vinyl record vs. digital song files, film cameras vs. digital cameras, or alcohol thermometers vs. digital thermometers.	Student Edition: 312-321, 322-339 Encounter/Explain the Phenomenon 323 Investigations 314, 316, 327, 330-331, 333 Labs 323, 328 STEM Project: Out with the Old, In with the New 340-341
Standard 8.3.1 Plan and conduct an investigation and use the evidence to construct an explanation of how photosynthetic organisms use energy to transform matter. Emphasize molecular and energy transformations during photosynthesis.	Student Edition: 514-527, 528-541, 542-553 Encounter/Explain the Phenomenon 515, 543 Investigations 518, 530, 532 Labs 520-521 STEM Project: Sun Block 554-556
Standard 8.3.2 Develop a model to describe how food is changed through chemical reactions to form new molecules that support growth and/or release energy as matter cycles through an organism. Emphasis is on describing that during cellular respiration molecules are broken apart and rearranged into new molecules, and that this process releases energy.	Student Edition: 514-527, 528-541, 542-553 Encounter/Explain the Phenomenon 529 Investigations 530, 532 Labs 523, 535, 537, 545 STEM Project: Sun Block 554-556
Standard 8.3.3 Ask questions to obtain, evaluate, and communicate information about how changes to an ecosystem affect the stability of cycling matter and the flow of energy among living and nonliving parts of an ecosystem. Emphasize describing the cycling of matter and flow of energy through the carbon cycle.	Student Edition: 346-363, 367, 372, 382, 400-417, 440-451, 534-538, 544-548 Encounter/Explain the Phenomenon 347, 365, 385, 441 Investigations 351, 357, 367, 402, 432, 442, 444 Labs 349, 352, 413, 416, 537, 545, 548 STEM Project: Who's moving in next door? 420-422; 7.6 Billion and Counting 452-454
Standard 8.4.1 Construct a scientific explanation based on evidence that shows that the uneven distribution of Earth's mineral, energy, and groundwater resources is caused by geological processes. Examples of uneven distribution of resources could include Utah's unique geologic history that led to the formation and irregular distribution of natural resources like copper, gold, natural gas, oil shale, silver, and uranium.	Student Edition: 458-471, 472-493, 494-507 Encounter/Explain the Phenomenon 459 Investigations 85, 464, 466, 475, 478, 479, 483, 485, 488, 489, 501, 502-503 Labs 461, 460, 469, 496-497, 498, 499 STEM Project: Where in the world? 508-510
Standard 8.4.2 Engage in argument supported by evidence about the effect of per capita consumption of natural resources on Earth's systems. Emphasize that these resources are limited and may be non-renewable. Examples of evidence include rates of consumption of food and natural resources such as freshwater, minerals, and energy sources.	Student Edition: 426-439, 440-451, 458-471, 491, 494-507 Encounter/Explain the Phenomenon 427, 441, 495 Investigations 432, 435, 442, 444, 448, 466, 501, 502-503 Labs 460, 469, 496-497, 498, 499 STEM Project: 7.6 Billion and Counting 452-454

Standard 8.4.3 Design a solution to monitor or mitigate the potential effects of the use of natural resources. Evaluate competing design solutions using a systematic process to determine how well each solution meets the criteria and constraints of the problem. Examples of uses of the natural environment could include agriculture, conservation efforts, recreation, solar energy, and water management	Student Edition: 156, 440-451, 458-471, 494-507 Encounter/Explain the Phenomenon Investigations 88, 447, 448 Labs 462, 466, 469, 496-497, 498 STEM Project: Cookin' with the Sun 165-167