



COLORADO
Science Content Standards Grades 5-8
The Nature of Matter K
Chemistry L
Motion, Forces, and Energy M
Electricity and Magnetism N
Waves, Sound, and Light O
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CONTENT STANDARDS	PAGE REFERENCES
STANDARD 1: Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations. As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> identifying and evaluating alternative explanations and procedures; 	(K) <i>Science and History</i> 32 <i>Communicating Your Data</i> 24 A 7 CYD 53 (L) <i>Communicating Your Data</i> 27 ACT 12 (M) <i>Lab</i> 26-27 CYD 149
<ul style="list-style-type: none"> using examples to demonstrate that scientific ideas are used to explain previous observations and to predict future events (for example, plate tectonics and future earthquake activity); 	(K) <i>Lab</i> 88-89 A 31 CU 61 (M) <i>Launch Lab</i> 125 <i>Lab</i> 88-89 <i>MiniLab</i> 11 A 11, 165 (N) <i>MiniLab</i> 46 A 26
<ul style="list-style-type: none"> asking questions and stating hypotheses that lead to different types of scientific investigations (for example, experimentation, collecting specimens, constructing models, researching scientific literature); 	(K) <i>Lab</i> 62-63 <i>You Do It</i> 5 AIL 30, 118 (L) <i>Lab</i> 54-55 AIL 54 (M) <i>You Do It</i> 5 SJ 4 IL 70 (N) ACT 12

CONTENT STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> creating a written plan for an investigation; 	(K) <i>Lab</i> 62-63, 88-89 (L) <i>AIL</i> 54 (M) <i>Lab</i> 56-57, 174-175 <i>Chapter Review</i> 61 #29 (O) <i>Lab</i> 86-87 <i>Chapter Review</i> 123 #28 ACT 4 IL 72
<ul style="list-style-type: none"> using appropriate tools, technologies, and measurement units to gather and organize data; 	(K) <i>Lab</i> 53 VL 75 (L) <i>Lab</i> 54-55 A 85 (M) <i>Lab</i> 88-89, 174-175 ACT 128 (N) <i>Lab</i> 28-29 ACT 12 (O) <i>Lab</i> 26-27
<ul style="list-style-type: none"> interpreting and evaluating data in order to formulate conclusions; 	(K) <i>Lab</i> 30-31 (L) <i>Lab</i> 107 (M) <i>Lab</i> 168, 174-175 ACT 4, 45 A 130 (N) <i>Lab</i> 27 A 27 (O) <i>Lab</i> 46
<ul style="list-style-type: none"> communicating results of their investigations in appropriate ways (for example, written reports, graphic displays, oral presentations); 	(K) <i>Communicating Your Data</i> 63 A 81 E 4 (L) <i>CYD</i> 55 (M) <i>Communicating Your Data</i> 27, 117 <i>Chapter Review</i> 153 #28 A 164 (N) A 85 (O) <i>Communicating Your Data</i> 57
<ul style="list-style-type: none"> using metric units in measuring, calculating, and reporting results; 	(K) <i>Lab</i> 53 A 74 (L) <i>Lab</i> 54-55 ACT 37 (M) <i>Lab</i> 81 D 101 ACT 17 SJ 45 (N) <i>Lab</i> 28-29 (O) <i>Lab</i> 118-119
<ul style="list-style-type: none"> explaining that scientific investigations sometimes result in unexpected findings that lead to new questions and more investigations; and 	(K) 12-14 <i>Oops! Accidents in Science</i> 64 (M) E 5

CONTENT STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> giving examples of how collaboration can be useful in solving scientific problems and sharing findings. 	(K) 9-17 <i>Communicating Your Data</i> 77 ACT 14 VL 75 (M) <i>Lab</i> 26-27 <i>Communicating Your Data</i> 149 CYD 55 (N) <i>The Nature of Science</i> 2-5 CC 4
STANDARD 2: Physical Science: Students know and understand common properties, forms, and changes in matter and energy. (Focus: Physics and Chemistry) 2.1 Students know that matter has characteristic properties, which are related to its composition and structure. As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> examining, describing, comparing, measuring, and classifying objects based on common physical and chemical properties (for example, states of matter, mass, volume, electrical charge, temperature, density, boiling points, pH, magnetism, solubility); 	(K) 72-76 <i>Launch Lab</i> 71 <i>Lab</i> 77, 117 A 71 ACT 74 LD 74 (L) <i>Lab</i> 86-87 (M) 78 (N) ACT 12
<ul style="list-style-type: none"> separating mixtures of substances based on their properties (for example, solubility, boiling points, magnetic properties, densities); 	(K) 28 <i>Section Review</i> 29 #2 A 29 (L) 65 VL 65 DI 67
<ul style="list-style-type: none"> classifying and describing matter in terms of elements, compounds, mixtures, atoms, and molecules (for example, copper is an element, water is a compound, air is a mixture); and 	(K) 9, 18, 25-29 <i>Lab</i> 24, 30-31 ACT 9, 27 D 27 (L) 64-66 QD 66
<ul style="list-style-type: none"> developing simple models to explain observed properties of matter (for example, using a particle model to account for the solubility of a substance). 	(K) 41-44, 57-58 UA 42 MM 73 (L) 70-72 SJ 73 (N) 40

CONTENT STANDARDS	PAGE REFERENCES
2.2 Students know that energy appears in different forms, and can move (be transferred) and change (be transformed).	
As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> measuring quantities associated with energy forms (for example, temperature, mass, speed, distance, electrical charge, current, voltage); and 	(K) <i>Lab 53</i> (M) <i>MiniLab 133, 143</i> IL 127 ACT 128 (N) <i>Lab 27</i> ACT 47 (O) <i>Lab 26-27, 46</i> LD 38
<ul style="list-style-type: none"> describing qualitative and quantitative relationships, using data and observations and graphs, associated with energy transfer or energy transformation (for example, speed of object vs. height of ramp; length of string vs. pitch of sound; electric current vs. volume of gas produced in electrolysis, with length of time kept constant). 	(M) <i>Launch Lab 125</i> <i>Lab 168</i> <i>MiniLab 133</i> QD 99 IL 127 CU 130 (N) <i>Lab 28-29</i> A 46 (O) <i>MiniLab 11</i> A 50
2.3 Students understand that interactions can produce changes in a system, although the total quantities of matter and energy remain unchanged.	
As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> identifying and classifying factors causing change within a system (for example, force, light, heat); 	(K) IL 82 (L) <i>Lab 77</i> SJ 73 (M) <i>Lab 25</i> MM 112 ACT 111 (N) <i>Lab 28-29</i> IL 51 (O) <i>Lab 26-27, 86-87</i>
<ul style="list-style-type: none"> identifying and predicting what will change and what will remain unchanged when matter experiences an external force or energy change (for example, boiling a liquid; comparing the force, distance, and work involved in simple machines); 	(K) 57-58 <i>Lab 53</i> A 52 VL 56 (L) <i>MiniLab 40</i> A 79 (M) <i>Launch Lab 97</i> A 25 CU 73 (N) <i>MiniLab 46</i>
<ul style="list-style-type: none"> observing and gathering data to support the concept of conservation of mass within a closed system (for example, precipitation reaction, forming mixtures, gas production); 	(K) 87 (L) 40 <i>MiniLab 40</i> <i>Applying Math 42</i> <i>Section Review 45 #3</i> VL 40

CONTENT STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> describing, measuring (for example, temperature, mass, volume, melting point of a substance) and calculating quantities before and after a chemical or physical change within a system (for example, temperature change, mass change, specific heat); and 	(K) 72-76 <i>Launch Lab 39</i> <i>Lab 53, 88-89</i> A 81 QD 83 (L) <i>Launch Lab 35</i> <i>MiniLab 40</i> <i>Lab 53</i> ACT 37
<ul style="list-style-type: none"> describing, measuring (for example, time, distance, mass, force) and calculating quantities that characterize moving objects and their interactions within a system (for example, force, velocity, acceleration, potential energy, kinetic energy). 	(M) 8-24 <i>Launch Lab 7</i> <i>Lab 25, 55</i> <i>MiniLab 133</i> IL 12 A 13 ACT 17, 23 CU 18
STANDARD 3: Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment. (Focus: Biology-- Anatomy, Physiology, Botany, Zoology, Ecology) 3.1 Students know and understand the characteristics of living things, the diversity of life, and how living things interact with each other and with their environment. As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> constructing and using classification systems based on the structure of organisms; 	See Glencoe's <i>Life's Structure and Function A</i> © 2005 (A) 24-28 <i>Launch Lab 7</i> <i>Lab 29</i> <i>Reference Handbook 223-226</i> IL 25
<ul style="list-style-type: none"> describing the importance of plant and animal adaptations, including local examples; 	(L) <i>Integrate Life Science 82</i> (M) 87, 111 <i>Integrate Life Science 135, 166</i> A 81 (N) 42 (O) 41, 54, 74
<ul style="list-style-type: none"> creating and interpreting food chains and food webs; 	See Glencoe's <i>Ecology E</i> © 2005 (E) 20-21, 50-53 MAM 22 VL 23, 52 DIF 51 AC 51 DIV 75

CONTENT STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> explaining the interaction and interdependence of nonliving and living components within ecosystems; and 	(K) 108-109 A 111 (L) <i>National Geographic</i> 80 CD 50 D 105 (M) 133, 142, 167 (N) 42 <i>Science and Society</i> 30
<ul style="list-style-type: none"> describing how an environment's ability to provide food, water, space, and essential nutrients determines carrying capacity. 	(M) 167 Also see Glencoe's <i>Ecology E</i> © 2005 (E) 15 <i>Applying Science</i> 15 <i>National Geographic</i> 18 AC 15 RC 15
3.2 Students know and understand interrelationships of matter and energy in living systems. As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> describing the basic processes of photosynthesis and respiration and their importance to life (for example, set up a terrarium or aquarium and make changes such as blocking out light); 	(L) D 44 (M) DI 129
<ul style="list-style-type: none"> comparing and contrasting food webs within and between different ecosystems (for example, grasslands, tundra, marine) and predicting the consequences of disrupting one of the organisms in a food web; 	See Glencoe's <i>Ecology E</i> © 2005 (E) 21, 51-52 MAM 22 AC 51 VL 52 DIV 75
<ul style="list-style-type: none"> describing ways (for example, digestion, transport of nutrients by circulatory system) that multicellular organisms get food and other matter to their cells; 	See Glencoe's <i>Human Body Systems D</i> © 2005 (D) 47-53, 64-69, 74-75 <i>Launch Lab</i> 35 TTPK 47
<ul style="list-style-type: none"> explaining the recycling of materials by determining a pathway of a substance that is important for life (for example, trace water through an ecosystem); and 	(L) D 105 Also see Glencoe's <i>Ecology E</i> © 2005 (E) 44-47, 49 <i>National Geographic</i> 48 DIF 46, 48 DIV 49 AS 49
<ul style="list-style-type: none"> describing the role of organisms in the decomposition and recycling of dead organisms (for example, bacteria's role in the decomposition and recycling of matter from a dead animal). 	(M) 133 Also see Glencoe's <i>From Bacteria to Plants B</i> © 2005 (B) 16, 51 <i>MiniLab</i> 16 LD 18

CONTENT STANDARDS	PAGE REFERENCES
3.3 Students know and understand how the human body functions, factors that influence its structures and functions, and how these structures and functions compare with those of other organisms.	
As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> describing the observable components and functions of a cell (for example, cell membrane, nucleus, cytoplasm, chloroplasts; movement of molecules into and out of cells); 	(M) 133-134 DI 129 (N) <i>National Geographic</i> 10
<ul style="list-style-type: none"> comparing and contrasting the basic structures and functions of different types of cells (for example, single-celled organisms in pond water, Elodea, onion cell, human cheek cell); 	(M) 133-134 (N) <i>National Geographic</i> 10
<ul style="list-style-type: none"> describing the growth and development of several organisms (for example, embryonic development of a vertebrate); 	See Glencoe's <i>From Bacteria to Plants B</i> © 2005 (B) 104-106, 110, 112-113
<ul style="list-style-type: none"> describing the structures and functions of human body systems; and 	(M) <i>National Geographic</i> 134 ACT 134 CU 137 (N) <i>National Geographic</i> 10 (O) 54-55
<ul style="list-style-type: none"> describing and giving examples of noncommunicable diseases and communicable diseases (for example, heart disease and chicken pox). 	(K) <i>Science Online</i> 61 <i>Lab</i> 118-119 (L) 115 AIL 116 (N) IL 10
3.4 Students know and understand how organisms change over time in terms of biological evolution and genetics.	
As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> describing the purpose of body cell division and sex cell division; 	See Glencoe's <i>Life's Structure and Function A</i> © 2005 (A) 98-104, 106-109 <i>Lab</i> 105 CC 107 AC 109 AS 111
<ul style="list-style-type: none"> describing the role of chromosomes and genes in heredity (for example, genes control traits, while chromosomes are made up of many genes); and 	See Glencoe's <i>Life's Structure and Function A</i> © 2005 (A) 100, 106-107, 114, 128 UAA 100 CC 107
<ul style="list-style-type: none"> describing evidence that reveals changes or constancy in groups of organisms over geologic time. 	See Glencoe's <i>Life's Structure and Function A</i> © 2005 (A) 165-167, 169-171, 172-175 TFYI 169

CONTENT STANDARDS	PAGE REFERENCES
<p>STANDARD 4: Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography) 4.1 Students know and understand the composition of Earth, its history, and the natural processes that shape it. As students in grades 5-8 extend their knowledge, what they know and are able to do includes</p>	
<ul style="list-style-type: none"> explaining how minerals, rocks, and soils form; 	(K) <i>Launch Lab</i> 71 <i>Integrate Earth Science</i> 29
<ul style="list-style-type: none"> explaining how fossils are formed and used as evidence to indicate that life has changed through time; 	See Glencoe's <i>The Changing Surface of Earth G</i> © 2005 (G) 124-131 <i>Try at Home MiniLab</i> 125 <i>Integrate Life Science</i> 130 <i>Section Review</i> 131 #1-7 DI 130 VL 130
<ul style="list-style-type: none"> modeling natural processes that shape Earth's surface (for example, weathering, erosion, mountain building, volcanic activity); and 	(L) 67, 79 ACT 88
<ul style="list-style-type: none"> explaining the distribution and causes of natural events (for example, earthquakes, volcanoes, landslides). 	(K) CC 51 (N) 49 CU 55 DI 3 (O) 14 IL 14 ACT 15 CC 28
<p>4.2 Students know and understand the general characteristics of the atmosphere and fundamental processes of weather. As students in grades 5-8 extend their knowledge, what they know and are able to do includes</p>	
<ul style="list-style-type: none"> describing the basic composition, properties, and structure of the atmosphere (for example, the range and distribution of temperature and pressure in the troposphere and stratosphere); 	(K) 55-56, 108-109 <i>Section Review</i> 61 #2 (M) 71-72 (N) 49 CU 55

CONTENT STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> observing, measuring, and recording changes in weather conditions (for example, humidity, temperature, air pressure, cloud types, wind, precipitation); 	(M) <i>Lab</i> 88-89 AIL 88 Also see Glencoe's <i>The Air Around You I</i> © 2005 (I) <i>Science Online</i> 45 <i>MiniLab</i> 53 <i>Model and Invent</i> 56-57 LD 38 IL 46 AC 49
<ul style="list-style-type: none"> explaining how atmospheric circulation is driven by solar heating (for example, the transfer of energy by radiation, convection, conduction); and 	(M) 164 Also see Glencoe's <i>The Air Around You I</i> © 2005 (I) 17-19, 20, 21-22, 24-25 <i>MiniLab</i> 19 <i>Section Review</i> 20 #1,6 <i>National Geographic Society Visualizing</i> 23 TP 17 DI 18 D 18
<ul style="list-style-type: none"> describing large-scale and local weather systems (for example, fronts, air masses, storms). 	(M) SJ 79 Also see Glencoe's <i>The Air Around You I</i> © 2005 (I) 44-48 <i>Section Review</i> 51 #1-3, 5,6 SJ 48 AC 49 CC 50 AS 51
4.3 Students know major sources of water, its uses, importance, and cyclic patterns of movement through the environment. As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> investigating and comparing the properties and behavior of water in its solid, liquid, and gaseous states; 	(K) 41-44, 47-52, 79 <i>Lab</i> 53 ACT 48 MM 73 (L) 21, 71-72 ACT 21 D 71
<ul style="list-style-type: none"> describing the distribution and circulation of the world's water through oceans, glaciers, rivers, groundwater, and atmosphere; and 	See Glencoe's <i>The Water Planet H</i> © 2005 (H) 24-25, 36-43, 44-45, 51-53, 69-74, 100, 104-109 <i>Section Review</i> 43 #1,3 TF 40
<ul style="list-style-type: none"> describing the composition and physical characteristics of oceans (for example, currents, waves, features of the ocean floor, salinity). 	(L) <i>Science Stats</i> 88 <i>Integrate Environment</i> 71 (O) 14 <i>Science Stats</i> 28 DI 9

CONTENT STANDARDS	PAGE REFERENCES
4.4 Students know the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.	
As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> describing the basic components, composition, size, and theories of origin of the solar system; 	(M) <i>Integrate Astronomy</i> 69 (O) <i>National Geographic</i> 78
<ul style="list-style-type: none"> explaining the effects of relative motion and positions of the Sun, Earth, and Moon (for example, seasons, eclipses, moon phases, tides); 	See Glencoe's <i>Astronomy J</i> © 2005 (J) 43-45, 46-50 <i>Section Review</i> 45 #2-6 AC 43 QD 49 UA 49
<ul style="list-style-type: none"> comparing Earth to other planets (for example, size, composition, relative distance from the Sun); and 	See Glencoe's <i>Astronomy J</i> © 2005 (J) 83 <i>MiniLab</i> 79 <i>Applying Math</i> 80 AS 74 TF 77 QD 78 CC 85
<ul style="list-style-type: none"> identifying technology needed to explore space (for example, telescopes, spectroscopes, spacecraft, life support systems). 	(M) 52 D 52 (O) 77-79, 114-115 <i>Integrate History</i> 115 ACT 78 MM 115 A 117
STANDARD 5: Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.	
As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> investigating and describing the extent of human uses of renewable and non-renewable resources (for example, forests, fossil fuels); 	(L) <i>Integrate Earth Science</i> 98 (M) 140-147 <i>Applying Science</i> 142 <i>Lab</i> 148-149 ACT 150 SJ 140 R 147 D 145, 150 AIL 148
<ul style="list-style-type: none"> describing advantages and disadvantages that might accompany the introduction of a new technology (for example, mountain bikes, cellular telephones, pagers); 	(L) <i>The Nature of Science</i> 2-5 E 5 (M) 141-142, 147 SJ 145 AIL 148 (N) <i>Science and Society</i> 86 (O) B 88

CONTENT STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> describing how the use of technology can help solve an individual or community problem (for example, using catalytic converters on automobiles to help reduce air pollution); and 	(L) 51 (M) <i>Science and Society</i> 58, 118, 176 DI 134 (N) AP 36 CD 53 (O) 25 <i>Oops! Accidents in Science</i> 120 <i>Integrate Social Studies</i> 48
<ul style="list-style-type: none"> describing how people use science and technology in their professions. 	(K) 116 <i>Integrate Career</i> 108 (L) DI 22 (M) <i>Integrate Life Science</i> 37 <i>Integrate Social Studies</i> 20 (N) CC 68 (O) <i>National Geographic</i> 78 CC 41, 118 SJ 42
STANDARD 6: Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines. As students in grades 5-8 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> explaining why a controlled experiment must have comparable results when repeated; 	(K) <i>Science Skill Handbook</i> 132 (O) <i>The Nature of Science</i> 4-5 ACT 4
<ul style="list-style-type: none"> giving examples of how scientific knowledge changes as new knowledge is acquired and previous ideas are modified (for example, through space exploration); 	(K) 9-17 <i>Science and History</i> 32 R 17 HS 32 D 21 (M) 39 <i>The Nature of Science</i> 2-3 E 5 (O) <i>Integrate Physics</i> 103
<ul style="list-style-type: none"> describing contributions to the advancement of science made by people in different cultures and at different times in history; 	(K) 98-99 ACT 14 CD 107 (M) <i>Integrate History</i> 43 CC 136 (N) <i>The Nature of Science</i> 3-4 (O) <i>The Nature of Science</i> 2-3 <i>Science and History</i> 88 SJ 115 CD 109
<ul style="list-style-type: none"> identifying, comparing, and predicting variables and conditions related to change (for example, climate, population, motion); 	(K) <i>Lab</i> 53 CC 47 (L) 48-52 IL 49 (M) <i>Lab</i> 25, 55, 88-89, 168 ACT 38 (O) <i>Lab</i> 118-119

CONTENT STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> identifying and illustrating natural cycles within systems (for example, water, planetary motion, geological changes, climate); and 	(K) <i>Applying Science</i> 103 <i>Launch Lab</i> 97 (L) D 105 (M) 146 (N) 42
<ul style="list-style-type: none"> using a model to predict change (for example, computer simulation, video sequence, stream table). 	(L) <i>Lab</i> 26-27 (M) <i>MiniLab</i> 17 <i>Lab</i> 26-27 DI 12 (N) A 26 (O) A 114

Codes Used for TWE Pages

A	Assessment
ACT	Activity
AIL	Alternative Inquiry Lab
AP	About the Photo
B	Brainstorm
CC	Curriculum Connection
CD	Cultural Diversity
CU	Check for Understanding
CYD	Communicating Your Data
D	Discussion
DI	Differentiated Instruction
E	Extension
HS	Historical Significance
IL	Inquiry Lab
LD	Lab Demonstration
MM	Make a Model
QD	Quick Demo
R	Reteach
SJ	Science Journal
UA	Use an Analogy
VL	Visual Learning