



NEVADA
Science Content Standards for Grade 8
Introduction to Physical Science © 2005

OBJECTIVES	PAGE REFERENCES
Physical Science	
Content Standard 1.0: Forces and Motion — <i>Students understand that forces such as gravitational, electrical, and magnetic influence the motion of objects.</i>	
By the end of Grade 8 , students know and are able to do everything required in previous grades and:	
1.8.1 Investigate and describe that multiple forces acting on an object along a straight line affect the motion of an object. M 7.8.2; M 9.8.3	I/S SE: 310-315, 316-321 <i>LAB 330-331</i> TWE: USW 311 QD 312 VL 318 IM 318
1.8.2 Describe the force (gravity) which makes objects fall and planets move in their orbits.	E/S SE: 317-318, 321 <i>Launch LAB 5</i> <i>Integrate History 317</i> TWE: CC 317 D 320 VL 320
1.8.3 Investigate and describe that certain physical principles are used in the design and function of simple machines.	I/S SE: 417-423 <i>National Geographic 421</i> <i>MiniLAB 422</i> <i>LAB 424-425</i> TWE: TPK 417 IL 418 SJ 418 A 419 LD 420 MM 420
1.8.4 Investigate and describe that buoyancy changes the apparent weight of an object immersed in a fluid. M 2.8.2; M 9.8.3	I/S SE: 120-121, 348-354 <i>LAB 124-125, 355</i> TWE: A 351 QD 351
1.8.5 Investigate and explain that electric current produces magnetic forces, and moving magnets produce electric forces in conductors .	I/S SE: 621-627 <i>MiniLAB 622</i> <i>LAB 632-633</i> TWE: VL 622, 624 QD 624 TFYI 624 LD 626 USW 626 IL 627

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Content Standard 2.0: Structure and Properties of Matter — <i>Students understand that materials have distinct properties which depend on the amount of matter present, its chemical composition, and structure.</i>	
By the end of Grade 8 , students know and are able to do everything required in previous grades and:	
2.8.1 Use simple models to explain observed properties of matter (e.g., use a particle model to account for the states of matter).	E/S SE: 102-106, 107-114, 136 <i>National Geographic</i> 110 TWE: DI (Challenge) 103, 137 MM 103 UA 104 IM 109
2.8.2 Separate substances based on their physical and chemical properties (e.g., color, solubility, chemical reactivity , melting point, boiling point).	E/S SE: 87-91, 134-138, 139-142 <i>MiniLAB</i> 88, 136 <i>Applying Science</i> 89 <i>LAB</i> 92-93 TWE: DI 89 QD 90 CA 91 IL 141
2.8.3 Use models or drawings to explain how atoms may join together to form molecules or large groups of molecules.	I/S SE: 170-178 <i>MiniLAB</i> 173 <i>National Geographic</i> 176 <i>LAB</i> 179, 180-181 TWE: MM 176 CA 178
2.8.4 Explain that all atoms are made up of protons, neutrons, and electrons.	E/S SE: 74-79, 83-84 TWE: A 76 D 77 IL 77 MM 78 DI 83
2.8.5 Explain that liquids, solids, and gases are systems of particles.	I/S SE: 102-106 <i>National Geographic</i> 110 TWE: A 104 LD 105 QD 106
2.8.6 Explain that various elements combine in a multitude of ways to produce all known living and non-living substances.	E/S SE: 80-85, 87-88, 170-175 <i>LAB</i> 86, 179 <i>MiniLAB</i> 173 TWE: TPK 87 D 89 LD 174 IL 174

OBJECTIVES	PAGE REFERENCES
Content Standard 3.0: Energy and Matter: Interactions and Forms — <i>Students understand that changes in temperature and pressure can alter states of matter. Energy exists in many forms, and one form can change into another.</i>	
By the end of Grade 8 , students know and are able to do everything required in previous grades and:	
3.8.1 Investigate and describe how heat moves from one object to another at different rates, depending on what the objects are made of and whether they are touching each other.	E/L SE: 438-441 <i>MiniLAB 441</i> <i>LAB 444</i> TWE: IL 439 LD 442
3.8.2 Investigate and describe how all phase changes are accompanied by changes in energy.	E/S SE: 107-114 <i>National Geographic 110</i> <i>Applying Science 111</i> <i>MiniLAB 112</i> TWE: IM 109 A 110 DI 110 D 111
3.8.3 Investigate and describe how waves transfer energy and move at different speeds in different materials.	I/S SE: 462-466, 471, 474 TWE: VL 463 MM 463 DI 463 IM 476
3.8.4. Investigate, create, and describe parallel, series, and combination circuits.	I/S SE: 596-599 <i>MiniLAB 598</i> <i>LAB 603, 604-605</i> TWE: MM 597, 600 VL 598 QD 599 AIL 604
3.8.5 Investigate and describe how energy may be transferred into or out of a system or object in many ways and readily changes forms.	E/S SE: 379-385 <i>MiniLAB 380</i> <i>National Geographic 382</i> TWE: IM 372F LD 380 QD 381
3.8.6 Identify the energy involved in a particular process as potential (energy of position and stored chemical energy) or kinetic (energy of motion).	E/S SE: 374-376, 379-380 <i>MiniLAB 381</i> <i>LAB 386</i> TWE: IL 375 USW 376 LD 380 D 383

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Content Standard 4.0: Chemical Reaction — <i>Students understand that chemical reactions change substances into different substances.</i>	
By the end of Grade 8 , students know and are able to do everything required in previous grades and:	
4.8.1 Investigate and describe how in chemical reactions , the total mass is conserved and the elements involved do not change into other elements.	E/S SE: 74, 194-195 <i>MiniLAB</i> 194 <i>Applying Math</i> 196 TWE: VL 194 MM 194 DI 195 A 195
4.8.2 Investigate and describe how the rate of a chemical reaction can be influenced by variables such as temperature, pH , and light.	E/S SE: 200-206 <i>MiniLAB</i> 204 TWE: D 202 A 202 IL 203 QD 203 LD 205
4.8.3 Investigate and describe how materials may give off heat or light when they react chemically with each other.	E/S SE: 196-199 <i>LAB</i> 208-209 TWE: QD 193 USW 197 D 197 VL 198 SJ 198 AIL 208
4.8.4 Predict common properties of elements using the Periodic Table.	E/S SE: 80-86 <i>National Geographic</i> 82 <i>LAB</i> 86 TWE: A 81, 82, 84 QD 84
Content Standard 5.0: Nuclear Energy and Electromagnetic Energy — <i>Students understand that nuclear energy and electromagnetic energy are produced from both natural and human-made sources in many forms.</i>	
By the end of Grade 8 , students know and are able to do everything required in previous grades and:	
5.8.1 Investigate and describe how light interacts with matter by moving through the matter, being absorbed by matter, or being scattered by the matter.	I/S SE: 550-552, 555-557 TWE: IM 548F D 553 TPK 555 A 556, 557 MM 556 VL 556
5.8.2 Describe some applications of radioactive isotopes including using nuclear energy to produce heat. H 10.8.1	W/L SE: 378, 389 TWE: QD 389
5.8.3 Compare and contrast between high and low level nuclear wastes and their associated hazards. H 10.8.3	I/S SE: 389 TWE: AIL 396

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5.8.4 Investigate and describe how the sun produces energy in a range of wavelengths within the electromagnetic spectrum .	E/S SE: 527-529 <i>National Geographic</i> 532 TWE: D 529 USW 529 UA 530
5.8.5 Compare and contrast the nuclear processes that occur in the sun and stars as well as in nuclear reactors.	I/S SE: 389 TWE: FF 389
5.8.6 Explain how nuclear reactions convert small amounts of matter into a relatively large amount of energy.	W/L SE: 378, 389 TWE: QD 389 FF 389
The Nature and History of Science	
Content Standard 18.0: Scientific, Historical, and Technological Perspectives — <i>Students understand that science is a unique way of knowing about things. Many men and women have contributed to the traditions of science. The ability to pursue activities and careers in science is accessible to people from all cultures and all levels of ability.</i>	
By the end of Grade 8 , students know and are able to do everything required in previous grades and:	
18.8.1 Explain that scientific investigations involve the use of logic, respect for the rules of evidence, openness to criticism, and public reporting of methods and procedures. C 5.8.6	E/S SE: 16-18, 27-29 <i>MiniLAB</i> 23 <i>LAB</i> 31 TWE: DI 16 TFYI 16 IL 17 QD 18
18.8.2 Explain that scientific inquiry done in a school setting is similar to what scientists do.	I/L SE: <i>LAB</i> 92-93, 124-125, 240-241, 300-301, 329, 632-633 TWE: AIL 32, 150, 424
18.8.3 Explain, using examples, that ancient peoples provided knowledge about the natural world that is still regarded as valid today, even though that knowledge may not have originated by scientific methods.	I/L SE: 73, 351 <i>National Geographic</i> 2-3 <i>Integrate History</i> 73, 317 <i>Science and History</i> 94 <i>Science and Society</i> 272 TWE: CD 122, 283, 326 CC 291
18.8.4 Explain that scientists may work in teams and some may work alone, but all communicate extensively with each other.	E/L SE: 9-11, 17 Analysis of shared data: <i>Communicating Your Data</i> 125, 151, 209, 271, 331 TWE: D 9 IM 10 DI 10

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<p>18.8.5 W/L Explain that scientific inquiry and technological design have similarities and differences. Scientists propose explanations for questions about the natural world and engineers propose solutions relating to human problems, needs, and aspirations.</p>	<p>SE: 11 Products of technology: 360, 445-449, 499, 526-527, 567-571 <i>Science and History</i> 210, 542 <i>Applying Science</i> 496 <i>Accidents in Science</i> 574</p>
<p>18.8.6 E/S Explain that scientific knowledge is revised through a process of incorporating new evidence gained through continual investigation.</p>	<p>SE: 7, 16, 74-79, 312-313, 533 <i>National Geographic</i> 532 TWE: VL 7 IM 15 TFYI 312</p>
<p>18.8.7 I/L Identify and describe how science is subject to strengths and limitations related to other human social and intellectual activities.</p>	<p>SE: 6 TWE: CC 312 DI 389</p>
<p>Content Standard 19.0: Reasoning and Critical Response Skills—<i>Students understand that many decisions require critical consideration of scientific evidence.</i></p>	
<p>By the end of Grade 8, students know and are able to do everything required in previous grades and:</p>	
<p>19.8.1 E/S Identify and evaluate critically the use of statistics, data, and graphs. E 2.8.4; E 4.8.4; G 7.8.3; M 5.8.5; M 6.8.5; M 7.8.12</p>	<p>SE: 28-29, 44-47, 56-59, 703, 710-711 <i>LAB</i> 60-61 TWE: A 28 D 29, 58 LD 57</p>
<p>19.8.2 I/L Give examples of human activities with their associated benefits, costs, and risks. Ec 1.8.3</p>	<p>SE: 269, 388-389 <i>Science and History</i> 152 <i>National Geographic</i> 234 <i>LAB</i> 270-271 <i>Science and Society</i> 452 TWE: D 152 A 234 SJ 388 AIL 396</p>
<p>19.8.3 W/L Analyze and describe a system for efficiency, optimal function, and possible sources of malfunction. M 6.8.2; M 6.8.9</p>	<p>SE: 356-361, 412-416, 417-423 <i>Applying Math</i> 415 <i>MiniLAB</i> 422 <i>LAB</i> 424-425 TWE: D 357 A 419 MM 420, 442 LD 420 AIL 632</p>
<p>19.8.4 E/S Critically evaluate information to distinguish between fact and opinion when responding to information. C 4.8.4; E 4.8.4</p>	<p>SE: 27-30, 678 <i>LAB</i> 31 TWE: D 28 QD 29</p>

Codes Used for TWE Pages

A	Activity
AIL	Alternative Inquiry Lab
CA	Check Assessment
CC	Curriculum Connection
CD	Cultural Diversity
D	Discussion
DI	Differentiated Instruction
FF	Fun Fact
IL	Inquiry Lab
IM	Identifying Misconceptions
LD	Lab Demonstration
MM	Make a Model
QD	Quick Demo
SJ	Science Journal
TFYI	Teacher FYI
TPK	Tie to Prior Knowledge
UA	Use an Analogy
USW	Use Science Words
VL	Visual Learning