



NEVADA
Science Content Standards for Grade 8
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: 52-53 TWE: TPK 52 QD 53 VL 53
1.8.2 Describe the force (gravity) which makes objects fall and planets move in their orbits.	E/S SE: 75-78 TWE: SCB 66E SJ 73 TPK 75 QD 76 FF 76
1.8.3 Investigate and describe that certain physical principles are used in the design and function of simple machines.	I/S SE: 132, 138-145 <i>National Geographic</i> 140 <i>Lab</i> 147 <i>Lab</i> 148-149 TWE: SCB 124E QD 139 VL 141 LD 142 AC 144
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: 485-486 <i>MiniLAB</i> 486 TWE: SO 12 RC 485 TPK 485
1.8.5 Investigate and explain that electric current produces magnetic forces, and moving magnets produce electric forces in conductors .	I/S SE: 231-237, 238-240 <i>National Geographic</i> 241 TWE: USW 211 SCB 222E QD 233 IL 234 SO 237

OBJECTIVES	PAGE REFERENCES
<p>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></p>	
<p>By the end of Grade 8, students know and are able to do everything required in previous grades and:</p>	
<p>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).</p>	<p>E/S SE: 476-480 TWE: SCB 474E TPK 476 RC 478 IL 479</p>
<p>2.8.2 Separate substances based on their physical and chemical properties (e.g., color, solubility, chemical reactivity, melting point, boiling point).</p>	<p>E/S SE: 458-461, 463 <i>MiniLAB</i> 460 TWE: DIN 459 LD 460 AC 461 QD 463</p>
<p>2.8.3 Use models or drawings to explain how atoms may join together to form molecules or large groups of molecules.</p>	<p>I/S SE: 504, 579, 611, 614, 620 <i>National Geographic</i> 613 TWE: RC 579</p>
<p>2.8.4 Explain that all atoms are made up of protons, neutrons, and electrons.</p>	<p>E/S SE: 506-508, 513, 520 <i>MiniLAB</i> 509 <i>National Geographic</i> 510 TWE: RC 507 UA 508 DI 511</p>
<p>2.8.5 Explain that liquids, solids, and gases are systems of particles.</p>	<p>I/S SE: 476-480 TWE: UA 477 IL 479 DI 483</p>
<p>2.8.6 Explain that various elements combine in a multitude of ways to produce all known living and non-living substances.</p>	<p>E/S SE: 504 TWE: AP 504</p>
<p>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></p>	
<p>By the end of Grade 8, students know and are able to do everything required in previous grades and:</p>	
<p>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.</p>	<p>E/L SE: 164-167 <i>National Geographic</i> 166 <i>MiniLAB</i> 168, 169 <i>Lab</i> 171 TWE: TPK 164 LD 165 UA 165 DI 167 FYI 169</p>

OBJECTIVES	PAGE REFERENCES
3.8.2 Investigate and describe how all phase changes are accompanied by changes in energy.	E/S SE: 477-480 TWE: RC 477, 478, 480
3.8.3 Investigate and describe how waves transfer energy and move at different speeds in different materials.	I/S SE: 290-293, 296-301, 304, 386-387 <i>National Geographic</i> 294 <i>Lab</i> 302 TWE: QD 291 RC 304 UA 304 DIN 305 FYI 386
3.8.4. Investigate, create, and describe parallel, series, and combination circuits.	I/S SE: 207-209 <i>Lab</i> 214-215 TWE: RC 207 LD 208 AC 208, 209 FYI 209
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: 107-112, 174-179, 210-213, 235-237 <i>National Geographic</i> 110 <i>MiniLAB</i> 112 TWE: MM 108 LD 110 IL 174, 234
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: 100-105, 108-112 <i>MiniLAB</i> 103 <i>National Geographic</i> 110 TWE: SJ 101 MM 108 QD 108 DI 109
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: 632-640 <i>MiniLAB</i> 636 TWE: SCB 630E-F UA 633 DI 635 AS 637
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 Reaction rates are discussed on pages SE: 646-650 <i>Lab</i> 651
4.8.3 Investigate and describe how materials may give off heat or light when they react chemically with each other.	E/S SE: 646-648 <i>National Geographic</i> 647 TWE: DI 650

OBJECTIVES	PAGE REFERENCES
4.8.4 Predict common properties of elements using the Periodic Table.	E/S SE: 517-523, 572-576, 578-582, 584-589 TWE: DI 521 DIN 521 FYI 573 TPK 578 FYI 580
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: 384-388, 400-403, 424-428 <i>MiniLAB 387</i> <i>Lab 405</i> <i>Lab 406-407</i> TWE: SCB 382E TPK 384, 400 FYI 385 FF 387 DI 425
5.8.2 Describe some applications of radioactive isotopes including using nuclear energy to produce heat. H 10.8.1	W/L SE: 264-267, 514-515, 538-540, 544-545, 551-554 <i>National Geographic 555</i> TWE: FYI 265 SCB 504E ILS 514
5.8.3 Compare and contrast between high and low level nuclear wastes and their associated hazards. H 10.8.3	I/S SE: 268-269 TWE: AC 268 DI 269
5.8.4 Investigate and describe how the sun produces energy in a range of wavelengths within the electromagnetic spectrum .	E/S SE: 173-174, 480 Energy from the sun is discussed on 534 <i>Launch Lab 255</i>
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: 264-267, 270-271, 553 TWE: MM 266 AS 270 FYI 553
5.8.6 Explain how nuclear reactions convert small amounts of matter into a relatively large amount of energy.	W/L SE: 264-267, 270, 551-553 <i>MiniLAB 552</i> TWE: VL 266 FF 553

OBJECTIVES	PAGE REFERENCES
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: 6-11, 788-796 <i>Lab</i> 28-29, 58-59, 90-91, 716-717 TWE: FF 8 AC 9
18.8.2 Explain that scientific inquiry done in a school setting is similar to what scientists do.	I/L Teachers can make the connection between what scientists do as compared to students by using the following pages and most of the <i>Labs</i> in the text. SE: 7-10
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: 485, 509 <i>National Geographic</i> 510 TWE: CD 8 FYI 16 AIL 28
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: 506, 796 TWE: AIL 28
18.8.5 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.	W/L The differences between science and technology are discussed on page SE: 13
18.8.6 Explain that scientific knowledge is revised through a process of incorporating new evidence gained through continual investigation.	E/S The changeability of scientific theories is discussed on page SE: 12 TWE: SJ 11 IL 12
18.8.7 Identify and describe how science is subject to strengths and limitations related to other human social and intellectual activities.	I/L Objectivity and bias are discussed on page SE: 10

OBJECTIVES	PAGE REFERENCES
Content Standard 19.0: Reasoning and Critical Response Skills — <i>Students understand that many decisions require critical consideration of scientific evidence.</i>	
By the end of Grade 8 , students know and are able to do everything required in previous grades and:	
19.8.1 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	E/S SE: 9-10, 22-26, 39, 41, 43, 50, 480 <i>MiniLAB 25</i> TWE: SCB 4F DI 23 AC 23 FYI 24
19.8.2 Give examples of human activities with their associated benefits, costs and risks. Ec 1.8.3	I/L SE: 262-263, 267-269, 459, 734 <i>Integrate Environment 459</i> TWE: IL 260 AC 262, 268 FYI 268 DIN 268
19.8.3 Analyze and describe a system for efficiency, optimal function, and possible sources of malfunction. M 6.8.2; M 6.8.9	W/L Efficiency is discussed on pages SE: 136-137 Open and closed systems are discussed on page SE: 175 TWE: AS 137 SJ 175
19.8.4 Critically evaluate information to distinguish between fact and opinion when responding to information. C 4.8.4; E 4.8.4	E/S The difference between scientific explanations and opinions is discussed on page SE: 12 TWE: IL 12

Codes Used for TWE Pages

AC	Activity
AIL	Alternative Inquiry Lab
AP	About the Photo
AS	Assessment
CD	Cultural Diversity
DI	Discussion
DIN	Differentiated Instruction
FF	Fun Fact
FYI	Teacher FYI
IL	Inquiry Lab
ILS	Integrate Life Science
LD	Lab Demonstration
MM	Make a Model
QD	Quick Demo
RC	Reading Check
SCB	Science Content Background
SJ	Science Journal
SO	Science Online
TPK	Tie to Prior Knowledge
UA	Use an Analogy
USW	Use Science Words
VL	Visual Learning