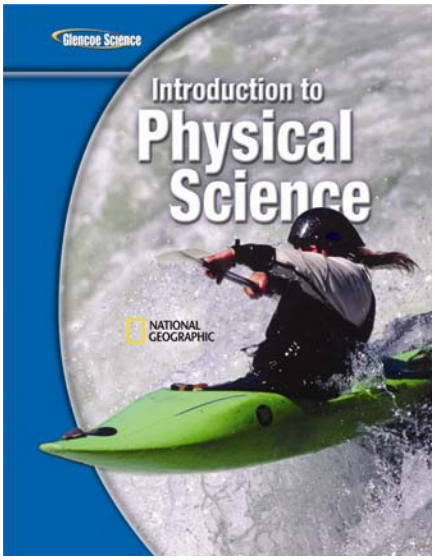
Glencoe

Academic Standards: Physical Science
Grades 6-8

Minnesota



Introduction to Physical Science

STANDARDS	PAGE REFERENCES
GRADES 6-8	
I. HISTORY AND NATURE OF SCIENCE	
A. Scientific World View	
The student will understand that science is a way of knowing about the world that is characterized by empirical criteria, logical argument and skeptical review.	
1. The student will distinguish between scientific evidence and personal opinion.	**Student Edition:** 27-30, 678 *LAB* 31 **Teacher Wraparound Edition:** D 28; QD 29 **Teacher's Resources:** *Chapter Resources Chapter 1* 29, T2
2. The student will explain why scientists often repeat investigations to be sure of the results.	**Student Edition:** 28-29, 670 **Teacher Wraparound Edition:** D 29I **Teacher's Resources:** *Chapter Resources Chapter 1* 13, 32, 46, T4

Codes used for Teacher Wraparound Edition pages are the initial caps of headings on that page.

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3. The student will recognize that scientists assume that the laws of nature are the same everywhere and that they are understandable and predictable.	**Student Edition:** 7 **Teacher Wraparound Edition:** CA 11; D 7; TPK 6 **Teacher's Resources:** *Chapter Resources Chapter 1* 21-22, 24, 29
4. The student will define scientific facts, laws and theories.	**Student Edition:** 7 **Teacher Wraparound Edition:** CA 11; D 7 References to specific laws as examples can be found on the following pages: 73, 312, 316, 323, 555, 597 **Teacher's Resources:** *Chapter Resources Chapter* 1 21, 24, 37, 41-42, T2 *Chapter Resources Chapter 7* 19, 21, 22, 27-29, 33-34, T2-T3
B. Scientific Inquiry	
The student will understand that scientific inquiry is used in systematic ways to investigate the natural world.	
1. The student will identify questions that can be answered through scientific investigation and those that cannot.	**Student Edition:** 6-7 *LAB* 31 **Teacher Wraparound Edition:** CD 18; IM 10, 15; TFYI 16 **Teacher's Resources:** *Chapter Resources Chapter 1* 29, T2
2. The student will distinguish among observation, prediction and inference.	**Student Edition:** 13-14, 16, 670, 673-674, 678 *MiniLAB* 14, 16 **Teacher Wraparound Edition:** LD 14; QD 23 **Teacher's Resources:** *Chapter Resources Chapter 1* 5, 30, 38, 43 *Chapter Resources Chapter 15* 9-11

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3. The student will use appropriate tools and Système International (SI) units for measuring length, time, mass, volume and temperature with suitable precision and accuracy.	**Student Edition:** 42-49, 50-54, 675-676 *LAB* 55, 115 *MiniLAB* 44, 52 *National Geographic* 46 **Teacher Wraparound Edition:** A 51; IL 48 **Teacher's Resources:** *Chapter Resources Chapter 2* 3-12, 26-27, 38 *Chapter Resources Chapter 3* 5-6 *Chapter Resources Chapter 5* 3, 9-10, 11-14 *Chapter Resources Chapter 6* 3, 9-11, 13-15 *Chapter Resources Chapter 7* 13-15 *Chapter Resources Chapter 9* 5-6, 10-11 *Chapter Resources Chapter 10* 5-6, 7-8, 13-15 *Chapter Resources Chapter 11* 5-6, 7-8
4. The student will present and explain data and findings from controlled experiments using multiple representations including tables, graphs, physical models and demonstrations.	**Student Edition:** 46-59 *LAB* 32-33, 60-61, 92-93, 180-181, 208-209, 330-331, 450-451, 572-5 **Teacher's Resources:** *Chapter Resources Chapter 2* 5-6, 17, 25, 37 *Chapter Resources Chapter 3* 3 *Chapter Resources Chapter 4* 7-8 *Chapter Resources Chapter 5* 13 *Chapter Resources Chapter 6* 7-8, 13-15 *Chapter Resources Chapter 7* 5-6, 11, 15 *Chapter Resources Chapter 9* 5-6, 8, 14-15 *Chapter Resources Chapter 10* 6, 7-8, 13-15 *Chapter Resources Chapter 12* 6 *Chapter Resources Chapter 14* 11

STANDARDS	PAGE REFERENCES
C. Scientific Enterprise	
The student will know that science and technology are human efforts that both influence and are influenced by society.	
1. The student will describe the types of questions asked, the products, and the methods of investigation used to distinguish science from technology.	**Student Edition:** 11 *Accidents in Science* 574 *Applying Science* 496 *Science and History* 542 Products of technology can be located on the following pages: 360, 445-449, 499, 526-527, 539, 567-571 **Teacher's Resources:** *Chapter Resources Chapter 1* 29, 32, 34, 35 *Chapter Resources Chapter 3* 40 *Chapter Resources Chapter 8* 43
2. The student will explain why scientists may work in teams or work alone, can collaborate and, at times, compete.	**Student Edition:** 9-11, 17 *Communicating Your Data* 125, 151, 209, 271, 331 **Teacher Wraparound Edition:** D 9; DI 10; IM 10 **Teacher's Resources:** *Chapter Resources Chapter 1* 32, 34, 38, 54 *Chapter Resources Chapter 2* 7-8
II. PHYSICAL SCIENCE	
A. Structure of Matter	
The student will understand that matter is made of small particles and this explains the properties of matter.	
1. The student will know that there are more than 100 different elements with unique properties.	**Student Edition:** 80-85 *LAB* 86 *National Geographic* 82 **Teacher Wraparound Edition:** A 82; CA 85; QD 84; TFYI 82; VL 83 **Teacher's Resources:** *Chapter Resources Chapter 3* 5-6, 18, 27, 29-30, 41

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2. The student will use evidence to explain that matter is made of small particles called atoms or molecules which are too small to see.	**Student Edition:** 72-79, 170-175 *LAB* 179, 180-181 *MiniLAB* 74 **Teacher Wraparound Edition:** A 73; IL 77; MM 78 **Teacher's Resources:** *Chapter Resources Chapter 3* 13, 15, 16, 23, 28, 29, 33
3. The student will know that the mass of a substance remains constant whether it is together, in parts or in a different state.	**Student Edition:** 53, 194 *MiniLAB* 194 **Teacher Wraparound Edition:** D 53; DI 195; USW 53; VL 194 **Teacher's Resources:** *Chapter Resources Chapter 3* 43-44
4. The student will describe the states of matter in terms of the space between particles.	**Student Edition:** 102-106 *National Geographic* 110 **Teacher Wraparound Edition:** A 104; LD 105; QD 106 **Teacher's Resources:** *Chapter Resources Chapter 4* 9-10, 15, 17, 19, 31-32
5. The student will distinguish between volume, mass and density.	**Student Edition:** 52-53, 121, 134, 352 *Applying Math* 121, 135 *MiniLAB* 52 **Teacher Wraparound Edition:** A 121; QD 135 **Teacher's Resources:** *Chapter Resources Chapter 5* 3, 9-10, 31, T2

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6. The student will use the characteristic properties of density, melting point, boiling point and solubility to identify and distinguish mixtures and pure substances.	**Student Edition:** 109, 112, 134-136, 227, 352 *Applying Science* 352 *MiniLAB* 136 **Teacher Wraparound Edition:** IL 226 **Teacher's Resources:** *Chapter Resources Chapter 3* 7-8, 27, 28, 31, 37 *Chapter Resources Chapter 5* 9-10, 17, T2-T3
7. The student will know that atoms are the smallest unit of an element that maintains the characteristics of the element.	**Student Edition:** 73-80, 83-85 *LAB* 86 **Teacher Wraparound Edition:** USW 86 **Teacher's Resources:** *Chapter Resources Chapter 3* 9-10, 11-12, 13, 15
B. Chemical Reactions	
The student will differentiate between chemical and physical changes.	
1. The student will define chemical and physical changes.	**Student Edition:** 143-148 *LAB* 149 *MiniLAB* 145 **Teacher Wraparound Edition:** A 147; DI 146; LD 145; MM 147; QD 146 **Teacher's Resources:** *Chapter Resources Chapter 5* 5-6, 11-13, 15, 19, 20, 27, 33, 36, 38-39, 44, T3-T4
2. The student will observe that substances react chemically with other substances to form new substances with different characteristic properties.	**Student Edition:** 145-148, 190-194 *LAB* 179, 207 **Teacher Wraparound Edition:** MM 194; UA 146 **Teacher's Resources:** *Chapter Resources Chapter 5* 19, 20, 27, 29

STANDARDS	PAGE REFERENCES
3. The student will give examples and classify substances as mixtures or pure substances.	**Student Edition:** 87-91, 218-220 *Applying Science* 89 *LAB* 92-93 *MiniLAB* 88 **Teacher Wraparound Edition:** A 90; AIL 92; D 89; QD 90, 220 **Teacher's Resources:** *Chapter Resources Chapter 3* 9-10, 15, 25, 31, T4
C. Energy Transformations	
The student will understand that energy exists in many forms and can be transferred in many ways.	
1. The student will compare and contrast heat, chemical, mechanical and electrical energy and identify transformations of energy from one form to another in everyday situations.	**Student Edition:** 374-378, 379-385 *LAB* 386 *National Geographic* 382 **Teacher Wraparound Edition:** A 376; D 377; DI 377; IL 375; SJ 377 **Teacher's Resources:** *Chapter Resources Chapter 8* 11-14, 19, 26, 29, 30, 38, 40, 45-46
2. The student will recognize that heat is transferred by convection, conduction and radiation from warmer objects to cooler ones until both reach the same temperature.	**Student Edition:** 438-441 *LAB* 444 *MiniLAB* 441 **Teacher Wraparound Edition:** IL 439; LD 442 **Teacher's Resources:** *Chapter Resources Chapter 10* 4, 5-6, 28, 33-34, T3

STANDARDS	PAGE REFERENCES
3. The student will demonstrate that visible light from the sun or reflected by objects may be made up of a mixture of many different colors of light.	**Student Edition:** 475, 528, 550-554 *LAB* 534 *MiniLAB* 551 **Teacher Wraparound Edition:** A 552; RFYI 528; VL 475 **Teacher's Resources:** *Chapter Resources Chapter 13* 5-6, 9-11, 43
4. The student will recognize the relationship between light and heat.	**Student Edition:** 377, 391-392 *MiniLAB* 391 **Teacher Wraparound Edition:** QD 381 **Teacher's Resources:** *Chapter Resources Chapter 8* 18, 40
5. The student will describe waves in terms of speed, frequency and wave length.	**Student Edition:** 467-471 *LAB* 472, 480-481 **Teacher Wraparound Edition:** A 470; D 469; DI 470; QD 470 **Teacher's Resources:** *Chapter Resources Chapter 11* 7-8, 9-12, 13-14, 17, 29, T2
6. The student will recognize that vibrations such as sound and earthquakes move in waves and that waves move at different speeds in different materials.	**Student Edition:** 492 *LAB* 480-481 *MiniLAB* 492 **Teacher Wraparound Edition:** AIL 480 **Teacher's Resources:** *Chapter Resources Chapter 11* 13-14, 28

STANDARDS	PAGE REFERENCES
D. Motion	
The student will describe the motion of objects.	
1. The student will use a frame of reference to describe the position, speed, and acceleration of an object.	**Student Edition:** 282-287, 289-292 *Applying Math* 284, 290 *MiniLAB* 285, 291 **Teacher Wraparound Edition:** A 283, 286; IL 286 **Teacher's Resources:** *Chapter Resources Chapter 6* 9-11, 20, 47-48
2. The student will measure and graph the positions and speed of an object.	**Student Edition:** 282-286 *Chapter Review (30)* 305 **Teacher Wraparound Edition:** A 286; CA 287; CC 286; DI 286 **Teacher's Resources:** *Chapter Resources Chapter 6* 13-15
3. The student will recognize that unbalanced forces acting on an object change the object's speed and/or direction.	**Student Edition:** 310-312, 316-318 *Lab* 330-331 **Teacher Wraparound Edition:** IM 318; QD 312; USW 311; VL 318 **Teacher's Resources:** *Chapter Resources Chapter 7* 5-6, 20, 47-48, T2

STANDARDS	PAGE REFERENCES
E. Forces of Nature	
The student will understand that a variety of forces govern the structure and motion of objects in the universe.	
1. The student will know that electric currents and magnets can exert a force on certain objects and each other.	**Student Edition:** 621-627 *LAB* 632-633 *MiniLAB* 622 **Teacher Wraparound Edition:** IL 627; LD 626; QD 624; RFYI 624; USW 626; VL 622, 624 **Teacher's Resources:** *Chapter Resources Chapter 16* 4, 7-8, 11-12, 16, 17, 24, 41-42, T3
2. The student will know that there are positive and negative charges and that like charges repel one another and opposite charges attract.	**Student Edition:** 584-589 *National Geographic* 586 **Teacher Wraparound Edition:** DI 585; QD 585, 587 **Teacher's Resources:** *Chapter Resources Chapter 3* 37 *Chapter Resources Chapter 15* 20, 27, 33 *Chapter Resources Chapter 16* 23, 25, 27, 39, T2