

GLENCOE CORRELATION
INTRODUCTION TO PHYSICAL SCIENCE
MARYLAND
Science Content Standards
Grade Eight

CONTENT STANDARDS	PAGE REFERENCES
1.0 Skills and Processes – Students will demonstrate the thinking and acting inherent in the practice of science.	
Scientific Inquiry	
By the end of grade 8 , students know and are able to do everything required at earlier grades and:	
1.8.1 access and process information from readings, investigations, and/or oral communications. (MLO 1.1.1)	SE: 524-526 <i>Skill Builder Activities</i> 30, 487 TWE: E 77, 84, 143, 279 R 93, 289 AR 243
1.8.2 formulate questions, which lead to the development of a testable hypothesis . (MLO 1.1.2)	SE: 12-16 <i>Activity</i> 31 <i>Design Your Own Experiment</i> 126-127, 214-215, 276-277 <i>Skill Builder Activities</i> 239
1.8.3 use observations, research, and select appropriate scientific information to form predictions and hypotheses . (MLO 1.1.3)	SE: <i>Activity</i> 94-95 <i>Skill Builder Activities</i> 182, 249, 420 <i>MiniLAB</i> 274 TWE: LD 14
1.8.4 recognize/develop well-designed procedures that identify the independent and dependent variables , the need for control when testing a factor, the importance of multiple trials, the selection of appropriate materials/equipment, and the development of clear, logical directions within an investigation . (MLO 1.1.4)	SE: 18, 523 <i>Activity</i> 32-33 <i>Design Your Own Experiment</i> 60-61 TWE: E 16 C 20 EA 95
1.8.5 demonstrate safety when conducting an investigation.	SE: 19-20, 543 <i>Activity</i> 94-95 TWE: CC 19 VL 19
1.8.6 use appropriate instruments and metric units when making measurements and collecting data. (MLO 1.1.5)	SE: 50-54, 525-526 <i>MiniLAB</i> 44 <i>Activity</i> 55, 296, 388 <i>Design Your Own Experiment</i> 60-61 TWE: QD 52 R 54
1.8.7 collect, organize, and display data in ways others can verify (i.e., numbers, statistics, tables, graphs, drawings, charts, diagrams) using appropriate instruments (e.g., <i>calculators, spreadsheets, databases, and graphing programs</i>). (MLO 1.1.6)	SE: <i>Skill Builder Activities</i> 59, 150 <i>Problem-Solving Activity</i> 17 <i>Activity</i> 183, 263 TWE: CYD 33 LD 57 A 148

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1.8.8 analyze and summarize data to identify trends and form a logical argument about a cause and effect relationship or a sequence of events. (MLO 1.1.7)	SE: <i>Skill Builder Activities</i> 232 <i>MiniLAB</i> 245 <i>Activity</i> 296 TWE: LD 57
1.8.9 interpret and communicate findings (i.e., <i>speaking</i> , writing, and drawing) in a form suited to the purpose and audience, using developmentally appropriate methods including technology tools and telecommunications. (MLO 1.1.8)	SE: 17, 534-535 <i>Skill Builder Activities</i> 150 <i>Activity</i> 250-251 TWE: R 26 E 243, 298 A 247
Critical Thinking	
1.8.10 describe similarities and differences of objects, materials, concepts, and actions. (MLO 1.2.1)	SE: 530 <i>Explore Activity</i> 135 <i>Skill Builder Activities</i> 144 <i>Design Your Own Experiment</i> 152-153 <i>MiniLAB</i> 319 TWE: A 84 C 93
1.8.11 construct and use classification systems for grouping objects, materials, concepts, and actions, organisms, etc. (MLO 1.2.2)	SE: 529 <i>Explore Activity</i> 135 <i>Skill Builder Activities</i> 144 <i>Design Your Own Experiment</i> 152-153 TWE: R 11
<i>1.8.12 critique scientific information and identify possible sources of bias.</i>	SE: 27-30, 531 <i>Activity</i> 31 TWE: D 28
1.8.13 analyze the adequacy of the supporting evidence used to form conclusions, devise a plan, or solve a practical problem. (MLO 1.2.3)	SE: 28-29, 531 <i>Skill Builder Activities</i> 30, 81 TWE: D 29 E 46
1.8.14 provide supporting evidence when forming conclusions, devising a plan or solving a practical problem. (MLO 1.2.4)	SE: <i>Problem-Solving Activity</i> 113 <i>Design Your Own Experiment</i> 126-127, 214-215 <i>MiniLAB</i> 245
1.8.15 analyze and extend patterns. (MLO 1.2.5)	SE: 83-87 <i>Activity</i> 88, 94-95 TWE: A 86 E 170
1.8.16 modify ideas based on new information from developmentally appropriate readings, data, and the ideas of others. (MLO 1.2.6)	SE: 16 TWE: IM 15, 72F, 102F, 192F, 226F, 372F, 402F
1.8.17 describe to others how scientific information was used. (MLO 1.2.7)	SE: 17 <i>Communicating Your Data</i> 55, 476 TWE: A 209

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Applications of Science	
1.8.18 apply scientific principles and/or concepts to understand a new situation. (MLO 1.3.1)	SE: <i>MiniLAB</i> 262 TWE: CC 122 SJ 205 E 270, 323 C 289
1.8.20 apply concepts and processes of science to take and defend a position relative to an issue. (MLO 1.3.2)	SE: 295 <i>Health Integration</i> 139 TWE: AR 243 C 249 D 305
1.8.21 use the knowledge of science and available scientific equipment to devise a plan to solve a global problem. (MLO 1.3.3)	SE: <i>Activity</i> 250-251 TWE: MM 248 C 249
Technology	
1.8.22 explain that a model has advantages and disadvantages and may need to be changed for different purposes. (MLO 1.4.1)	SE: 21-26, 527 <i>National Geographic</i> 24 <i>Design Your Own Experiment</i> 276-277 TWE: QD 23 A 24 R 26
1.8.23 demonstrate and explain that tools are essential to scientific investigation for such purposes as to observe , estimate, measure, compute, collect, and communicate scientific data and information (i.e., size, distance, motion). (MLO 1.4.2)	SE: 51, 53 <i>Design Your Own Experiment</i> 60-61, 214-215 <i>Activity</i> 117 TWE: R 54 LD 180
1.8.24 <i>design, plan, and construct things in response to a particular need or problem (e.g., instruments, machines, structures, and systems).</i>	SE: <i>Design Your Own Experiment</i> 126-127, 184-185, 276-277 <i>MiniLAB</i> 245, 478 <i>Activity</i> 461, 476
1.8.25 <i>evaluate and modify designs and products, when demonstrating that a solution to one problem can result in other problems and taking into account various constraints (e.g., gravity, property of materials, economic, political, social, ethical, and aesthetic issues).</i>	SE: 242-243 TWE: SJ 242
1.8.26 <i>explain that science and technology have strongly influenced life under different technological circumstances in the past and continue to do so today.</i>	SE: 391-393, 477-487 <i>Science and Society</i> 278-279 <i>Oops</i> 428-429 TWE: CC 266 CD 271, 485
History of Science	
1.8.27 <i>explain how people from different cultures and times have made important contributions to the advancement of science, mathematics, and technology in different cultures at different times.</i>	SE: 74-81 <i>Science and History</i> 34-35 TWE: CC 15, 238, 384 E 77 HS 97 CD 210, 417 SJ 298

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1.8.28 explain that scientists are employed in various fields that are located in diverse places ranging from laboratories to natural field settings and their findings become available to everyone in the world.	SE: 9-11 TWE: D 9 E 10 A 10
4.0 Chemistry - Students will use scientific skills and processes to explain the composition, structure, and interactions of matter in order to support the predictability of structure and energy transformations.	
Structure of Matter	
4.8.1 distinguish one substance from another based on observable and measurable properties (i.e., density, boiling point, melting point). (MLO 4.1)	SE: 111-116, 136-140, 141-144 <i>Design Your Own Experiment</i> 152-153 TWE: E 111 CA 125 IS 137
4.8.2 describe the development of the atomic theory from Democritus to Bohr (Grade 8 only).	SE: 75-81 <i>Physics Integration</i> 80 TWE: E 77 VL 79 C 81
Physical or Chemical Changes	
4.8.3 distinguish between chemical and physical changes based on observable properties. (MLO 4.2)	SE: 145-149 <i>Activity</i> 151 <i>Science and History</i> 154-155 TWE: IM 146 LD 147 A 148 R 150
Classification of Matter	
4.8.4 describe that elements combine in whole number ratios to form other substances called compounds (e.g., H ₂ O, CO ₂ , CO).	SE: 89-90 <i>Princeton Review</i> 101 TWE: MM 90 A 142
4.8.5 use groupings (i.e., simple periodic table, metals/non-metals, reactive/non-reactive) of matter to predict reactions. (MLO 4.3)	SE: 83-87, 141-144 <i>Activity</i> 88 <i>Design Your Own Experiment</i> 152-153 TWE: A 86 C 87
Conservation of Matter and Energy	
4.8.6 explain that matter and energy cannot be created or destroyed but instead can be changed from one form into another. (MLO 4.4)	SE: 76, 109-116, 234-237 <i>National Geographic</i> 236 <i>Activity</i> 240 TWE: LD 77, 234 IM 226F D 237 C 239
4.8.7 distinguish between mass and weight .	SE: 53, 177 TWE: D 53 USW 53 IM 178

CONTENT STANDARDS	PAGE REFERENCES
4.8.8 explain that atoms and molecules are in constant motion and that an increase in temperature will increase that motion.	SE: 104-108, 109-116 <i>National Geographic</i> 112 TWE: IM 111
5.0 Physics - Students will use scientific skills and processes to explain the interactions of matter and energy and the energy transformations that occur.	
Mechanics	
5.8.2 explain that matter and energy cannot be created or destroyed but instead can be changed from one form into another. (MLO 5.1)	SE: 76, 109-116, 234-237 <i>National Geographic</i> 236 <i>Activity</i> 240 TWE: LD 77, 234 IM 226F D 237 C 239
5.8.2 apply Newton's Laws of Motion (inertia, $F=ma$, action/reaction) to everyday situations. (MLO 5.2)	SE: 196-199, 200-206, 207-212 <i>MiniLAB</i> 198 <i>National Geographic</i> 209 TWE: R 199 A 203 C 206, 212
5.8.3 distinguish between mass and weight.	SE: 53, 177 TWE: D 53 USW 53 IM 178
5.8.4 measure and describe characteristics (i.e., speed, distance, mass, force) of moving objects and interactions (i.e., force, velocity, acceleration, potential energy, kinetic energy) within a system.	SE: 166-171, 173-176, 177-182, 234-237 <i>MiniLAB</i> 169-175 <i>Activity</i> 183 TWE: D 234
5.8.5 explain the fundamental concepts that underlie motions and forces and relationships among them (e.g. inertia, $F=ma$, action/reaction, equilibrium).	SE: 177, 194-196, 200-203, 207-211 <i>Activity</i> 203 <i>MiniLAB</i> 211 <i>Design Your Own Experiment</i> 214-215 TWE: LD 211
5.8.6 explain that every object exerts gravitational force on every other object. (MLO 5.3)	SE: 201 TWE: D 201
Thermodynamics	
5.8.7 explain that heat energy is a product of energy transformations (i.e., a runner, simple machines, complex machines). (MLO 5.4)	SE: 230, 235, 237 TWE: QD 231 D 237
5.8.8 explain that heat energy can be transferred through materials by conduction, convection and radiation .	SE: 290-293 <i>MiniLAB</i> 293 TWE: LD 294 C 295
5.8.9 explain how energy moves from warmer objects to cooler ones until equilibrium is reached.	SE: 110, 290, 300-301 <i>Activity</i> 296 TWE: SJ 110

CONTENT STANDARDS	PAGE REFERENCES
Electricity & Magnetism	
5.8.10 identify and describe how various types of electric circuits (i.e., series and parallel) provide a means of transferring and using electrical energy to produce heat, light, sound , as well as chemical changes. (MLO 5.5)	SE: 447-451, 452-455 <i>Activity</i> 459 TWE: C 451, 487
5.8.11 compare different ways of obtaining, transforming, and distributing energy from various sources (e.g., fossil fuels, sun, water, radioisotopes) and their impact on the environment.	SE: 241-249 <i>MiniLAB</i> 245 TWE: D 245, 246, 248 E 247 MM 248
5.8.12 explain that the strength of the magnetic force depends on the distance between the magnets and the object.	SE: 471 TWE: E 471 CC 471
5.8.13 describe the magnetic effects of current (i.e., electromagnet) and the electric effects of magnets (i.e., motors). (MLO 5.6)	SE: 477-480 <i>Activity</i> 488 TWE: QD 480
Wave Interactions	
5.8.14 describe behaviors (i.e., reflection, refraction and absorption) and properties (i.e., wave length, frequency, amplitude, velocity) of different kinds of waves. (MLO 5.7)	SE: 316-320, 321-325, 327-333 <i>Activity</i> 326 <i>MiniLAB</i> 328 <i>Design Your Own Experiment</i> 334-335 TWE: E 322 LD 330 C 333
5.8.16 explain that for an object to be “seen,” light reflected or emitted by an object must enter the eye.	SE: 405-406 <i>MiniLAB</i> 405
5.8.17 explain that white light is a mixture of many different colors and that colored light is a mixture of some of these colors.	SE: 407-408 TWE: E 406 QD 407 R 408
5.8.18 explain how the interaction of white light with an object produces the perceived color of the object.	SE: 406-407 TWE: E 407
Nuclear Energy	
5.8.19 identify that nuclear fission and fusion are alternate forms of energy.	SE: 232, 243

Codes Used for TWE Pages

A	Activity	HS	Historical Significance
AR	Active Reading	IM	Identifying Misconceptions
C	Challenge	IS	Inclusion Strategies
CA	Check Assessment	LD	Lab Demonstration
CC	Curriculum Connection	MM	Make a Model
CD	Cultural Diversity	QD	Quick Demo
CYD	Communicating Your Data	R	Reteach
D	Discussion	SJ	Science Journal
E	Extension	USW	Use Science Words
EA	Error Analysis	VL	Visual Learning