Standards for Science
End of Grade 8

Montana

Science

LEVEL BLUE

STANDARDS	PAGE REFERENCES
Content Standard 1—Students design, conduct, evaluate, and communicate processes and results of scientific investigations, and demonstrate thinking skills associated with this procedural knowledge.	
1. identify a question, determine relevant variables, formulate a testable hypothesis, plan and predict the outcome of an investigation, safely conduct scientific investigation, and compare and analyze data.	**Student Edition:** 13-15, 21-23 *Applying Science* 260, 372, 669 *Design Your Own LAB* 112-113, 424-425, 510-511, 598-599 *MiniLAB* 345, 615 *National Geographic* 20 *Science Skill Handbook* 724-732 **Teacher Wraparound Edition:** A 21; D 19
2. select and accurately use appropriate tools including technology to make measurements (in metric units), gather, process and analyze data from scientific investigations.	**Student Edition:** 16-19, 257-260 *Accidents in Science* 716 *Design Your Own LAB* 392-393, 598-599, 624-625 *Launch Lab* 5, 607 *MiniLAB* 388 *National Geographic* 675 *Science Skill Handbook* 728-732 *Technology Skill Handbook* 750 **Teacher Wraparound Edition:** D 26; QD 17

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

STANDARDS	PAGE REFERENCES
3. critically review, communicate and defend results of investigations.	**Student Edition:** 19-23, 47-48, 190-199, 229-231, 257-261 *Design Your Own LAB* 82-83, 510-511, 598-599 *Science Skill Handbook* 731-732 *Use the Internet LAB* 28-29, 200-201, 454-455 **Teacher Wraparound Edition:** CC 22; CYD 83, 511, 599; LD 19
4. create models to illustrate scientific concepts and use the model to predict change. (e.g., computer simulation, stream table, graphic representation)	**Student Edition:** 16-18, 226-231 *Design Your Own LAB* 570-571 *LAB* 189, 326-327, 656-657 *MiniLAB* 195 *Model and Invent LAB* 262-263, 360-361, 482-483 *Use the Internet LAB* 200-201 **Teacher Wraparound Edition:** FYI 16; MM 196
5. identify strengths and weakness in an investigation design.	**Student Edition:** 21-23, 254-255, 257-259, 420 *Applying Science* 14 *Integrate Physics* 340 *LAB* 569, 585, 656-657, 714-715 *National Geographic* 20 *Science and History* 114 **Teacher Wraparound Edition:** A 260; CYD 569; D 8, 258; DI 20; FYI 21; LD 19
Content Standard 2—Students demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems, and demonstrate thinking skills associated with this knowledge.	
1. classify, describe, and manipulate physical models of matter in terms of: elements, and compounds, pure substances and mixtures, atoms, and molecules.	**Student Edition:** 250-252, 405-413, 434-440, 441-447, 448-450 *Design Your Own LAB* 424-425, 624-625 *LAB* 12, 453, 481 *MiniLAB* 258, 411, 475 *Model and Invent LAB* 482-483 **Teacher Wraparound Edition:** FYI 16; IL 254; LD 258; MM 405; QD 251, 259; R 480; UA 467; VL 252

STANDARDS	PAGE REFERENCES
2. examine, describe, compare and classify objects and substances based on common physical properties and simple chemical properties.	**Student Edition:** 150-153, 272-273, 277-278, 290, 380-381, 386-387, 435-439, 441-447, 448-450, 468-469 *Integrate Chemistry* 456 *LAB* 12 *National Geographic* 51, 478 **Teacher Wraparound Edition:** A 110; FYI 382; LD 476; TPK 380
3. describe energy and compare and contrast the characteristics of light, heat, motion, magnetism, electricity, sound and mechanical waves.	**Student Edition:** 106-107, 124, 136-137, 611, 612-615, 619, 643-645, 694-698, 702-703, 708-710 *LAB* 232-233 **Teacher Wraparound Edition:** FF 108; FYI 613; IL 214; TC 208, 606, 692
4. model and explain the states of matter are dependent upon the quantity of energy present in the system and describe what will change and what will remain unchanged at the particulate level when matter experiences an external force or energy change.	**Student Edition:** 612-613, 622-623 *LAB* 618 *MiniLAB* 614 **Teacher Wraparound Edition:** IL 613; SJ 620
5. identify, build, describe, measure, and analyze mechanical systems (e.g., simple and complex machines) and describe the forces acting within those systems.	**Student Edition:** 586-590, 591-597 *Design Your Own LAB* 598-599 *LAB* 585, 672, 684-685 *Launch Lab* 209, 579 *MiniLAB* 308, 596, 674 *National Geographic* 621 *Science and Society* 572 **Teacher Wraparound Edition:** TC 578; VL 596
6. analyze data in simple scientific contexts. (e.g., density)	**Student Edition:** 18, 48, 226-229, 336-337, 408-413, 434-440 *Applying Science* 14 *Design Your Own LAB* 82-83, 112-113 *Integrate Physics* 340 *LAB* 54-55, 189, 256 *Science and History* 114 *Use the Internet LAB* 28-29 **Teacher Wraparound Edition:** A 259; D 285; LD 258

STANDARDS	PAGE REFERENCES
Content Standard 3—Students demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment, and demonstrate thinking skills associated with this knowledge.	
1. compare the structure and function of prokaryotic cells (bacteria) and eukaryotic cells (plant, animal, etc.).	**Student Edition:** 68-71 Note: Bacterial cells are not discussed in this text.
2. explain how organisms and systems of organisms obtain and use energy resources to maintain stable conditions (e.g., photosynthesis, respiration).	**Student Edition:** 79-80, 106-107, 136-139 *Design Your Own LAB* 82-83 **Teacher Wraparound Edition:** DI 137; FYI 138; QD 80
3. communicate the differences in the reproductive processes of a variety of plants and animals using the principles of genetic modeling (e.g., Punnet squares).	**Student Edition:** 38-42, 44-48 **Teacher Wraparound Edition:** A 48
4. investigate and explain the interdependent nature of both the individuals and species in the environment and explain how they are affected by human interaction.	**Student Edition:** 38-39, 49-53, 94-97, 102-103, 136-139, 159, 163-165 *Integrate Earth Science* 160 *LAB* 54-55 *National Geographic* 51 *Science and Society* 172 *Use the Internet LAB* 170-171 **Teacher Wraparound Edition:** FF 160; FYI 102; IM 50
5. create and use a basic classification scheme to identify plants and animals, preferably using indigenous plants and animals.	**Student Edition:** 38, 247, 277-278 *Launch Lab* 37 *National Geographic* 51 **Teacher Wraparound Edition:** TPK 38
6. utilize correlational (e.g., population growth) and probabilistic (e.g., genetic sampling) thinking skills in simple contexts.	**Student Edition:** 14-15, 50-53, 99-102, 105 *Design Your Own LAB* 82-83, 112-113 *LAB* 54-55, 162 *National Geographic* 20, 51, 104 *Science and History* 114 *Use the Internet LAB* 28-29 **Teacher Wraparound Edition:** CC 104; DI 20; FF 25; FYI 16, 47

STANDARDS	PAGE REFERENCES
Content Standard 4—Students demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space, and demonstrate thinking skills associated with this knowledge.	
1. model and explain the internal structure of the earth and describe the formation and composition of earth's external features in terms of the rock cycle and plate tectonics.	**Student Edition:** 182-185, 186-188, 190-199, 210-218, 226-231, 279, 285, 288-293 *LAB* 189 *MiniLAB* 292 *National Geographic* 193 **Teacher Wraparound Edition:** CD 195; D 285; FYI 197, 223, 227; MM 230
2. differentiate between both rock types and mineral types and classify both by how they are formed and the utilization by humans. (e.g., arrowheads, cooking tools)	**Student Edition:** 243, 250-251, 280-282 *Integrate Social Studies* 245 *Science and History* 512 **Teacher Wraparound Edition:** D 252; FF 251; FYI 254
3. explain scientific theories about how fossils are used as evidence of changes over time.	**Student Edition:** 242-249, 254, 277-279, 288-289 *Launch Lab* 241 *MiniLAB* 282 *Model and Invent LAB* 262-263 *Use the Internet LAB* 294-295 **Teacher Wraparound Edition:** A 247; D 277; DI 243; FYI 282; TC 240
4. describe the water cycle, the composition and structure of the atmosphere and the impact of oceans on large scale weather patterns.	**Student Edition:** 125-128, 130-131, 614 *National Geographic* 134, 216 **Teacher Wraparound Edition:** FYI 126; IL 125; QD 127
5. describe and model the motion and tilt of earth in relation to the sun, and explain the concepts of day, night, seasons, year, and climatic changes.	**Student Edition:** 125, 309-311 *Integrate Physics* 340 *LAB* 326-327 *Launch Lab* 305 **Teacher Wraparound Edition:** FYI 309; QD 310; R 311; TC 304

STANDARDS	PAGE REFERENCES
6. describe the earth, moon, planets and other objects in space in terms of size, structure, and movement in relation to the sun.	**Student Edition:** 125, 309-311, 312-316, 336-337, 342-347, 348-353, 354-355, 356-359 *Integrate Physics* 340 *LAB* 321, 341 *Model and Invent LAB* 360-361 **Teacher Wraparound Edition:** FYI 337; QD 343; TPK 336
7. identify scientific theories about the origin and evolution of the earth and solar system.	**Student Edition:** 319, 338, 342-347, 348-353, 354-355 *National Geographic* 339 **Teacher Wraparound Edition:** FF 352
Content Standard 5—Students understand how scientific knowledge and technological developments impact today's societies and cultures.	
1. describe the specific fields of science and technology as they relate to occupations within those fields.	**Student Edition:** 25-27, 159, 322-323 *Integrate Career* 50, 127, 165, 197, 317, 467, 622 *Integrate Social Studies* 7, 245 *National Geographic* 422, 712 *Science and History* 114, 426 *Science and Society* 172, 600 **Teacher Wraparound Edition:** CD 10; D 26; FYI 75
2. apply scientific knowledge and process skills to understand issues and everyday events.	**Student Edition:** 14-15, 26 *Accidents in Science* 362 *Integrate Environment* 15 *Integrate Life Science* 617 *Integrate Social Studies* 7, 245 *National Geographic* 216, 518-519, 621, 712 *Science and History* 114, 234 *Science and Society* 172, 572, 658 *Use the Internet LAB* 200-201, 454-455 **Teacher Wraparound Edition:** A 26

STANDARDS	PAGE REFERENCES
3. simulate collaborative problem solving and give examples of how scientific knowledge and technology are shared with other scientists and the public.	**Student Edition:** 19, 25-27, 159, 408-411 *Design Your Own LAB* 82-83, 392-393, 424-425, 570-571, 598-599 *National Geographic* 20 *Science and History* 234 *Science Skill Handbook* 732 **Teacher Wraparound Edition:** A 228; CU 23; DI 540; FYI 411
4. use scientific knowledge to investigate problems and their proposed solutions and evaluate those solutions while considering environmental impacts.	**Student Edition:** 159 *Integrate Earth Science* 160 *Integrate Environment* 15 *National Geographic* 90-91, 152, 518-519 *Science and Society* 172, 658 *Use the Internet LAB* 170-171, 454-455 **Teacher Wraparound Edition:** D 151, 152; FYI 157
Content Standard 6—Students understand historical developments in science and technology.	
1. trace development that demonstrate scientific knowledge is subject to change as new evidence becomes available.	**Student Edition:** 182-185, 388-391, 404-413, 434-435 *Accidents in Science* 264, 716 *Integrate History* 75, 681 *Integrate Physics* 340 **Teacher Wraparound Edition:** A 27; DI 8
2. identify major milestones in science that have impacted science, technology, and society.	**Student Edition:** 44-48, 50-53, 182-185, 190-195, 257-261, 322, 336-339, 408-413, 434-439, 550-555, 556-562, 563-568, 591-597, 678-679 *Integrate Physics* 340 *National Geographic* 400-401 *Science and History* 426 **Teacher Wraparound Edition:** FF 21, 25; FYI 7, 53, 620

STANDARDS	PAGE REFERENCES
3. describe and explain science as a human endeavor.	**Student Edition:** 26, 44-48, 182-185, 190-195, 261, 274-276, 336-337, 389-391, 434-437, 496 *Accidents in Science* 264, 716 *Integrate History* 75 *Integrate Physics* 340 **Teacher Wraparound Edition:** CD 10, 350; DI 39; FF 21, 351, 497; FYI 7, 75, 187, 552; SJ 191, 260