



**Active Physics CoreSelect Correlation to the Colorado Model Content Standards
for
Physical Science, Grades 9-12**

STANDARD 1: Students apply the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Benchmark	Location/Page where Standard is found
1. ask questions and state hypotheses using prior scientific knowledge to help design and guide their development and implementation of a scientific investigation	142-146, 147-150, 239-255, 533-541, 634-645
2. select and use appropriate technologies to gather, process, and analyze data and to report information related to an investigation	512-525, 86-91, 129-134, 650-652, 771-776, 777-782, 147-150
3. identify major sources of error or uncertainty within an investigation (<i>for example: particular measuring devices and experimental procedures</i>)	147-150, 151-155, 239-255, 356, 167-170, 561-566
4. recognize and analyze alternative explanations and models	584, 574-575, 595-604, 567-575
5. construct and revise scientific explanations and models, using evidence, logic, and experiments that include identifying and controlling variables	86-93, 151-155, 147-150, 171-175, 239-255, 634-639, 595-604, 188-191
6. communicate and evaluate scientific thinking that leads to particular conclusions	620-621, 340-345, 86-91, 214-217, 142-146, 147-150, 158-160

PHYSICAL SCIENCE

STANDARD 2: Students know and understand common properties, forms, and changes in matter and energy. (Focus: Physics and Chemistry.)

Benchmark	Location/Page where Standard is found
<u>Structure and Properties of Matter</u>	
1. elements can be organized by their physical and chemical properties (Periodic Table)	587-594
2. the spatial configuration of atoms and the structure of the atoms in a molecule determine the chemical properties of the substance	556-560, 561-566, 567-575, 576-586, 587-594, 595-604, 605-611
3. there are observable and measurable physical and chemical properties that allow you to compare, contrast, and separate substances (<i>for example: pH, melting point, conductivity, magnetic attraction</i>)	548-555, 567-575, 576-586, 587-594
4. word and chemical equations are used to relate observed changes in matter to its composition and structure (for example: conservation of matter (4))	556-560, 567-575
<u>Forms and Transfer of Energy</u>	
5. quantitative relationships involved with thermal energy can be identified, measured, calculated and analyzed (<i>for example: heat transfer in a system involving mass, specific heat, and change in temperature of matter</i>)	416-420, 433-440, 411-415, 421-424
6. energy can be transferred through a variety of mechanisms and in any change some energy is lost as heat (<i>for example: conduction, convection, radiation, motion, electricity, chemical bonding changes</i>)	411-415, 416-420, 421-424, 486-497
7. light and sound waves have distinct properties; frequency, wavelengths and amplitude	326-339, 340-345, 346-353, 354-361, 362-370, 371-376, 377-385, 386-390, 748-753, 754-58, 764-770, 771-776, 576-586, 672-677, 678-682, 641-649, 650-655
8. quantities that demonstrate conservation of mass and conservation of energy in physical interactions can be measured and calculated	433-440, 231-238, 31-44, 576-586, 605-611, 194-202, 612-619, 714-719, 63-66, 486-497

Forces and Motion

9. Newton's Three Laws of Motion explain the relationship between the forces acting on an object, the object's mass, and changes in its motion

8-12, 18-24, 45-49, 71-72, 656-664, 665-671, 99-104, 105-110, 634-640, 697-702, 703-708, 117-121, 122-128, 253-265, 266-285

STANDARD 5: Students understand that the nature of science involves a particular way of building knowledge and making meaning of the natural world.

Benchmark	Location/Page where Standard is found
1. print and visual media can be evaluated for scientific evidence, bias, or opinion	672-677
2. the scientific way of knowing uses a critique and consensus process (<i>for example: peer review, openness to criticism, logical arguments, skepticism</i>)	572-574, 455-462, 147-150, 665-671, 672-677
3. graphs, equations or other models are used to analyze systems involving change and constancy (<i>for example: comparing the geologic time scale to shorter time frame, exponential growth, a mathematical expression for gas behavior; constructing a closed ecosystem such as an aquarium</i>)	455-462, 463-471, 184-193, 600-601, 709-713, 561-566, 582-584, 411-415, 80-85, 665-671, 86-93, 147-150
4. there are cause-effect relationships within systems (<i>for example: the effect of temperature on gas volume, effect of carbon dioxide level on the greenhouse effect, effects of changing nutrients at the base of a food pyramid</i>)	218-230, 99-104, 111-116, 433-440, 486-497
5. scientific knowledge changes and accumulates over time; usually the changes that take place are small modifications of prior knowledge but major shifts in the scientific view of how the world works do occur	656-664, 665-671, 576-586, 672-677, 572-574
6. interrelationships among science, technology and human activity lead to further discoveries that impact the world in positive and negative ways	400-404, 405-410, 411-415, 416-420, 421-424, 425-428, 429-432, 486-497, 498-502, 99-104, 105-110, 111-116
7. there is a difference between a scientific theory and a scientific hypothesis	672-677, 572-574