**Prentice Hall Conceptual Physics (Hewitt) © 2009**
**Correlated to:**
**Colorado Science Standards and Benchmarks**
**(Grades 9-12)**

| COLORADO SCIENCE STANDARDS AND BENCHMARKS | PAGE (S) WHERE TAUGHT (If submission is not a text, cite appropriate resource(s)) |
|---|---|
| STANDARD 1: Students apply the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations. | |
| GRADES 9-12 | |
| In grades 9-12, students know and are able to: | |
| 1. ask questions and state hypotheses using prior scientific knowledge to help design and guide their development and implementation of a scientific investigation | *In addition to the activities in the lab manual and the "discover!" activities in the text, the opportunity to address this standard is found on the following pages:* SE/TE: 2-4 |
| 2. select and use appropriate technologies to gather, process, and analyze data and to report information related to an investigation | *In addition to the activities in the lab manual and the "discover!" activities in the text, the opportunity to address this standard is found on the following pages:* SE/TE: 5 |
| 3. identify major sources of error or uncertainty within an investigation (for example: particular measuring devices and experimental procedures) | *In addition to the activities in the lab manual and the "discover!" activities in the text, the opportunity to address this standard is found on the following pages:* SE/TE: 2-4 |
| 4. recognize and analyze alternative explanations and models | *In addition to the activities in the lab manual and the "discover!" activities in the text, the opportunity to address this standard is found on the following pages:* SE/TE: 767-773 |
| 5. construct and revise scientific explanations and models, using evidence, logic, and experiments that include identifying and controlling variables | *In addition to the activities in the lab manual and the "discover!" activities in the text, the opportunity to address this standard is found on the following pages:* SE/TE: 2-4 |
| 6. communicate and evaluate scientific thinking that leads to particular conclusions | *In addition to the activities in the lab manual and the "discover!" activities in the text, the opportunity to address this standard is found on the following pages:* SE/TE: 2-4 |

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|---|---|
| STANDARD 2: Physical Science: Students know and understand common properties, forms, and changes in matter and energy. (Focus: Physics and Chemistry) | |
| GRADES 9-12 | |
| In grades 9-12, students know and can demonstrate understanding that: | |
| Structure and Properties of Matter | |
| 1. elements can be organized by their physical and chemical properties (Periodic Table) | SE/TE: 335-336, 774-775 |
| 2. the spatial configuration of atoms and the structure of the atoms in a molecule determine the chemical properties of the substance | *The opportunity to address this standard is found on the following pages:* SE/TE: 330-331 |
| 3. there are observable and measurable physical and chemical properties that allow you to compare, contrast, and separate substances (for example: pH, melting point, conductivity, magnetic attraction) | *The opportunity to address this standard is found on the following pages:* SE/TE: 330-331, 345-351 |
| 4. word and chemical equations are used to relate observed changes in matter to its composition and structure (for example: conservation of matter) | *The opportunity to address this standard is found on the following pages:* SE/TE: 330-331, 792, 795-796, 809, 814, 824 |
| Forms and Transfer of Energy | |
| 5. quantitative relationships involved with thermal energy can be identified, measured, calculated and analyzed (for example: heat transfer in a system involving mass, specific heat, and change in temperature of matter) | SE/TE: 406-422, 450-461 |
| 6. energy can be transferred through a variety of mechanisms and in any change some energy is lost as heat (for example: conduction, convection, radiation, motion, electricity, chemical bonding changes) | SE/TE: 430-443, 450-461, 470-481 |
| 7. light and sound waves have distinct properties; frequency, wavelengths and amplitude | SE/TE: 492-506, 515-525, 536-546 |

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| 8. quantities that demonstrate conservation of mass and conservation of energy in physical interactions can be measured and calculated | SE/TE: 153-160, 163, 330-331, 792, 795-796, 809, 814, 824 |
| 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 | SE/TE: 33-39, 87-97, 107-116 |
| STANDARD 4: Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography) | |
| GRADES 9-12 | |
| In grades 9-12, students know and can demonstrate understanding that: | |
| Earth's Composition, Processes and History | |
| 1. the Earth's interior has a composition and structure | *The opportunity to address this standard is found on the following pages:* SE/TE: 162, 244, 371, 732-733 |
| 2. the theory of plate tectonics helps to explain relationships among earthquakes, volcanoes, mid- ocean ridges, and deep-sea trenches | *The opportunity to address this standard is found on the following pages:* SE/TE: 732-733 |
| 3. the feasibility of predicting and controlling natural events can be evaluated (for example: earthquakes, floods, landslides) | *The opportunity to address this standard is found on the following pages:* SE/TE: 246-248, 442-443, 498 |
| 4. there are costs, benefits, and consequences of natural resource exploration, development, and consumption (for example: geosphere, biosphere, hydrosphere, atmosphere and greenhouse gas) | SE/TE: 5, 161-163, 248, 441-443, 481, 756, 812-816, 822-824 |
| 5. there are consequences for the use of renewable and nonrenewable resources | SE/TE: 5, 161-163, 248, 441-443, 481, 756, 812-816, 822-824 |

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| 6. evidence is used (for example: fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time (for example: Mount St. Helen's' eruption Pangaea, and geologic time) | *The opportunity to address this standard is found on the following pages:* SE/TE: 790, 796-798 |
| Atmosphere and Weather | |
| 7. the atmosphere has a current structure and composition and has evolved over geologic time (for example: effects of volcanic activity and the change of life forms) | *The opportunity to address this standard is found on the following pages:* SE/TE: 383-384, 441-443, 800-801 |
| 8. energy transferred within the atmosphere influences weather (for example: the role of conduction, radiation, convection, and heat of condensation in clouds, precipitation, winds, storms) | SE/TE: 409, 415-416, 434-436, 438, 440, 452-453, 567 |
| 9. weather is caused by differential heating, the spin of the Earth and changes in humidity (air pressure, wind patterns, coriolis effect) | SE/TE: 384-385, 415-416, 452-453 |
| 10. there are interrelationships between the circulation of oceans and weather and climate | SE/TE: 415-416 |
| 11. there are factors that may influence weather patterns and climate and their effects within ecosystems (for example: elevation, proximity to oceans, prevailing winds, fossil fuel burning, volcanic eruptions) | SE/TE: 385, 415-416, 441-443 |
| Earth's Water | |
| 12. water and other Earth systems interact (for example: the biosphere, lithosphere, and atmosphere) | SE/TE: 154 |
| 13. continental water resources are replenished and purified through the hydrologic cycle | SE/TE: 154, 451-454 |

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| Solar System and the Universe | |
| 14. gravity governs the motions observed in the solar system and beyond | SE/TE: 223, 233-237, 242-243, 249-254, 270-275 |
| 15. there is electromagnetic radiation produced by the Sun and other stars (for example: X- ray, ultraviolet, visible light, infrared, radio) | SE/TE: 437, 536, 753-755 |
| 16. stars differ from each other in mass, color, temperature and age | SE/TE: 249 |
| 17. the scales of size and separation of components of the solar system are complex | SE/TE: 223, 252-253, 270-275, 314 |
| STANDARD 5: Students understand that the nature of science involves a particular way of building knowledge and making meaning of the natural world. | |
| GRADES 9-12 | |
| In grades 9-12, students know and can demonstrate understanding that: | |
| 1. print and visual media can be evaluated for scientific evidence, bias, or opinion | *The opportunity to address this standard is found on the following pages:* SE/TE: 163, 204, 236, 248, 275, 481, 526, 648, 727, 756 |
| 2. the scientific way of knowing uses a critique and consensus process (for example: peer review, openness to criticism, logical arguments, skepticism) | SE/TE: 1-7 |
| 3. graphs, equations or other models are used to analyze systems involving change and constancy (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) | *The opportunity to address this standard is found in all chapters of the text.* |

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| 4. there are cause-effect relationships within systems (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) | SE/TE: 59, 87-97, 107-116, 125-136, 155-160, 175-180, 216-225, 303-316, 363-374, 389-395, 416-422, 431-443, 451-461, 470-481, 498-506, 515-525, 566-571, 588-595, 625-627 |
| 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 | SE/TE: 7, 29-34, 233-254, 270-271, 283-294, 311-316, 533-535, 767-770, 772-776 |
| 6. interrelationships among science, technology and human activity lead to further discoveries that impact the world in positive and negative ways | SE/TE: 163, 204, 236, 248, 275, 481, 526, 648, 727, 756 |
| 7. there is a difference between a scientific theory and a scientific hypothesis | SE/TE: 2-4 |