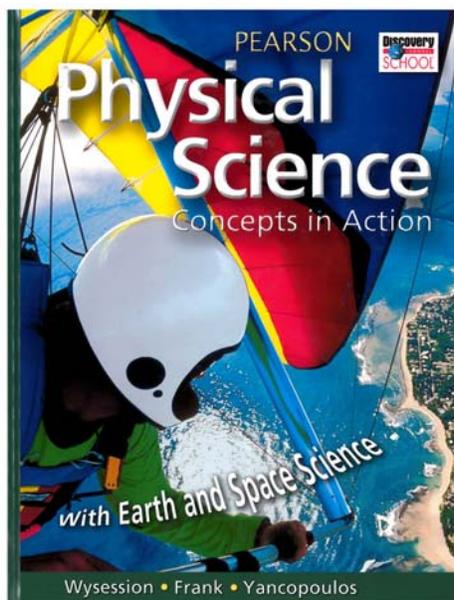


A Correlation of

# Physical Science Concepts in Action with Earth & Space Science

©2011



To the

## Colorado Academic Standards for Science

Physical Science Standards  
High School

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## **INTRODUCTION**

This document demonstrates how Pearson's ***Physical Science: Concepts in Action, with Earth & Space Science*** ©2011 meets the Colorado Academic Standards for Science, Physical Science Standards, grades 9-12. Correlation page references are to the Student and Teacher's Editions and cited at the page level.

***Physical Science: Concepts in Action*** helps students make the important connection between the science they read and what they experience every day. Relevant content, lively explorations and a wealth of hands-on activities take students' understanding of science beyond the page and into the world around them.

***Concepts in Action with Earth & Space Science*** includes five additional chapters: *Earth's Interior*, *Earth's Surface*, *Weather and Climate*, *The Solar System*, *Exploring the Universe*.

### 21<sup>st</sup> Century Skills

Each chapter in ***Physical Science*** begins with an activity geared toward developing one or more 21st century skills. All of these activities task students to capture what they are learning in biology class and apply the knowledge to solving real-life problems in order to encourage productive, thoughtful members of the 21st century world.

### Virtual Physical Science

A Pearson exclusive, this is the most robust interactive lab available. A proven formula for reading success before during, and after every lesson enables students to fully understand key concepts.

### The Complete Interactive Textbook

Available online and on CD-ROM. Audio of the full text read-aloud supports English language learners and reluctant readers. PresentationEXPRESS helps you create dynamic presentations with slides, videos, and participatory activities.

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<b>Colorado Academic Standards for Science</b>	<b>Physical Science: Concepts in Action, with Earth &amp; Space Science ©2011</b>
<b>New Colorado P-12 Academic Standards</b>	
<b>Content Area: Science</b>	
<b>Grade Level Expectations: High School</b>	
<b>Standard: 1. Physical Science</b>	
<b>Prepared Graduates:</b> Observe, explain, and predict natural phenomena governed by Newton's laws of motion, acknowledging the limitations of their application to very small or very fast objects	
<b>Concepts and skills students master:</b> 1. Newton's laws of motion and gravitation describe the relationships among forces acting on and between objects, their masses, and changes in their motion - but have limitations	
<b>Evidence Outcomes</b>	
<b>Students Can:</b>	
a. Gather, analyze and interpret data and create graphs regarding position, velocity and acceleration of moving objects (DOK 1-3)	<b>SE/TE:</b> 334, 336-337, 342-343, 344-345, 346-348, 349
b. Develop, communicate and justify an evidence-based analysis of the forces acting on an object and the resultant acceleration produced by a net force (DOK 1-3)	<b>SE/TE:</b> 356-357, 358
c. Develop, communicate and justify an evidence-based scientific prediction regarding the effects of the action-reaction force pairs on the motion of two interacting objects (DOK 1-3)	<b>SE/TE:</b> 357-359, 365-368, 373
d. Examine the effect of changing masses and distance when applying Newton's law of universal gravitation to a system of two bodies (DOK 1-2)	<b>SE/TE:</b> 9, 380-382
e. Identify the limitations of Newton's laws in extreme situations (DOK 1)	The following pages can be developed in meeting this standard, <b>SE/TE:</b> 380-382
<b>Prepared Graduates:</b> Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions	
<b>Concepts and skills students master:</b> 2. Matter has definite structure that determines characteristic physical and chemical properties	
<b>Evidence Outcomes</b>	
<b>Students Can:</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation supporting the current model of an atom (DOK 1-3)	<b>SE/TE:</b> 113-118

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b. Gather, analyze and interpret data on chemical and physical properties of elements such as density, melting point, boiling point, and conductivity (DOK 1-2)	<b>SE/TE:</b> 19, 27, 45-48, 119, 129, 135, 136, 140, 141, 143, 150-151, 176, 177
c. Use characteristic physical and chemical properties to develop predictions and supporting claims about elements' positions on the periodic table (DOK 1-2)	<b>SE/TE:</b> 45-48, 54-55, 126-129, 131-136
d. Develop a model that differentiates atoms and molecules, elements and compounds, and pure substances and mixtures (DOK 2-3)	<b>SE/TE:</b> 38-41, 114-115, 128, 166, 173, 265
<b>Prepared Graduates:</b> Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions	
<b>Concepts and skills students master:</b> 3. Matter can change form through chemical or nuclear reactions abiding by the laws of conservation of mass and energy	
<b>Evidence Outcomes</b>	
<b>Students Can:</b>	
a. Recognize, analyze, interpret, and balance chemical equations (synthesis, decomposition, combustion, and replacement) or nuclear equations (fusion and fission) (DOK 1-2)	<b>SE/TE:</b> 194-195, 199-200, 202-205, 208-209, 308-315
b. Predict reactants and products for different types of chemical and nuclear reactions (DOK 1-2)	The following pages can be developed in meeting this standard, <b>SE/TE:</b> 192-193, 195, 199-200, 202-205, 208-209
c. Predict and calculate the amount of products produced in a chemical reaction based on the amount of reactants (DOK 1-2)	<b>SE/TE:</b> 192, 195-197
d. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate the conservation of mass and energy (DOK 1-2)	<b>SE/TE:</b> 193-184, 209, 310, 455-457-458, 482

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<b>Prepared Graduates:</b> Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions	
<b>Concepts and skills students master:</b> 4. Atoms bond in different ways to form molecules and compounds that have definite properties	
<b>Evidence Outcomes</b>	
<b>Students Can:</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation supporting the current models of chemical bonding (DOK 1-3)	<b>SE/TE:</b> 156-159, 160-164, 165-169, 170-175, 176-181, 206-207, 232, 266, 284, 451
b. Gather, analyze, and interpret data on chemical and physical properties of different compounds such as density, melting point, boiling point, pH, and conductivity (DOK 1-2)	<b>SE/TE:</b> 40, 161-164, 168-169, 171-175, 229-230
c. Use characteristic physical and chemical properties to develop predictions and supporting claims about compounds' classification as ionic, polar or covalent (DOK 1-2)	<b>SE/TE:</b> 170-175
d. Describe the role electrons play in atomic bonding (DOK 1)	<b>SE/TE:</b> 117-118, 156-157, 158-164, 165-169
e. Predict the type of bonding that will occur among elements based on their position in the periodic table (DOK 1-2)	<b>SE/TE:</b> 160-161
<b>Prepared Graduates:</b> Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable	
<b>Concepts and skills students master:</b> 5. Energy exists in many forms such as mechanical, chemical, electrical, radiant, thermal, and nuclear, that can be quantified and experimentally determined	
<b>Evidence Outcomes</b>	
<b>Students Can:</b>	
a. Develop, communicate, and justify an evidence-based scientific explanation regarding the potential and kinetic nature of mechanical energy (DOK 1-3)	<b>SE/TE:</b> 6, 71, 164, 447-450, 456-457, 606
b. Use appropriate measurements, equations and graphs to gather, analyze, and interpret data on the quantity of energy in a system or an object (DOK 1-3)	<b>SE/TE:</b> 447-449, 450, 454
c. Use direct and indirect evidence to develop predictions of the types of energy associated with objects (DOK 2-3)	<b>SE/TE:</b> 447-452

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d. Identify different energy forms, and calculate their amounts by measuring their defining characteristics (DOK 1-2)	<b>SE/TE:</b> 447-449, 450-452
<b>Prepared Graduates:</b> Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable	
<b>Concepts and skills students master:</b> 6. When energy changes form, it is neither created nor destroyed; however, because some is necessarily lost as heat, the amount of energy available to do work decreases	
<b>Evidence Outcomes</b>	
<b>Students Can:</b>	
a. Use direct and indirect evidence to develop and support claims about the conservation of energy in a variety of systems, including transformations to heat (DOK 1-3)	<b>SE/TE:</b> 209, 453-455, 456-459
b. Evaluate the energy conversion efficiency of a variety of energy transformations (DOK 1-2)	<b>SE/TE:</b> Related Content: 282, 425-426, 454, 456-457, 491
c. Describe energy transformations both quantitatively and qualitatively (DOK 1-2)	<b>SE/TE:</b> 454-457
d. Differentiate among the characteristics of mechanical and electromagnetic waves that determine their energy (DOK 2)	<b>SE/TE:</b> 500-512, 532, 533-538
e. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate energy conservation and loss (DOK 1-2)	<b>SE/TE:</b> 209, 455, 457-457, 482