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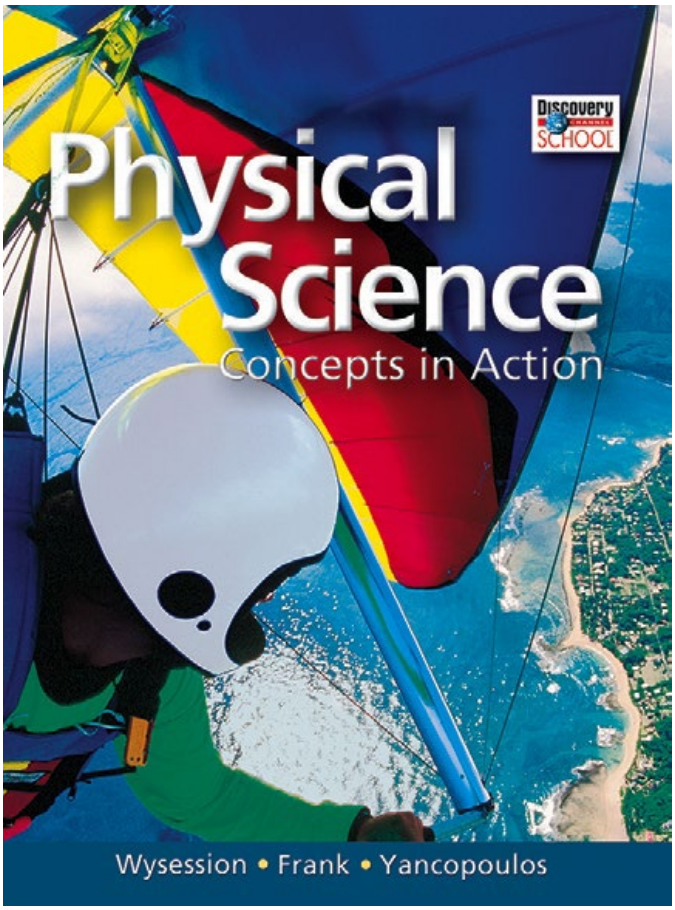
A Correlation of

Physical Science
Concepts in Action



To the

Oklahoma
2020 Academic Standards for Science
High School Physical Science

Prepared by Savvas Learning Company, formerly Pearson K12 Learning

A Correlation of Physical Science: Concepts in Action to the Oklahoma 2020 Academic Standards for Science High School Physical Science

Introduction

This document demonstrates how the ***Physical Science: Concepts in Action*** program supports the Oklahoma 2020 Academic Standards for Science: High School Physical Science. 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. Now includes even more technology, tools, and activities to support differentiated instruction!

The Savvas Advantage

- 21st century skills Each chapter in *Physical Science: Concepts in Action* 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 science class and apply that knowledge to solving real- life problems and encourage productive, thoughtful members of the 21st century world.
- A proven formula for reading success before, during, and after every lesson enables students to fully understand key concepts.
- Relevant content, lively explorations, and a wealth of hands-on activities help students understand science.
- *Physical Science: Concepts in Action* is now available on SavvasRealize.com.

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Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms.	**SE/TE:** Energy and Phase Changes, 86 Forms of Energy, 450 Energy Conversion, 454 Exploring Energy Conversion, 454 16.2 Assessment, 483 20.3 Assessment, 613 **TE Only:** Energy Transfer, 86 Efficiency, 410D Address Misconceptions, 489
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Science and Engineering Practice	
Planning and Carrying Out Investigations: Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.	**SE/TE:** Investigating Changes in temperature During Heating of Solids, 92 Investigating Charged Objects, 102 Comparing Vitamin C in Fruit Juices, 285 Investigating the Velocity of a Sinking Marble, 349 Investigating Force and Distance, 380 Investigating a Balloon Jet, 383 Investigating Elastic Potential Energy, 450 Investigating a Spring Clip, 467 Investigating Sound Waves, 524 Investigating an Electric Generator, 648
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Waves and Their Applications in Technologies for Information Transfer (PS4)	
Performance Expectation	
PS.PS4.1 Use mathematical representations to explain both qualitative and quantitative relationships among frequency, wavelength, and speed of waves traveling in various media.	**SE/TE:** Comparing Frequency and Wave Speed, 505 Math Skills, 506 Math Practice, 506 17.2 Assessment, 507 Math Skills, 535 Math Practice, 535 **TE Only:** For Extra Help, 506 Additional Problems, 506 For Extra Help, 535 Additional Problems, 535

SE = Student Edition TE = Student Edition

A Correlation of Physical Science: Concepts in Action to the Oklahoma 2020 Academic Standards for Science High School Physical Science

Oklahoma 2020 Academic Standards for Science High School Physical Science	Physical Science Concepts in Action
Disciplinary Core Ideas	
The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the type of wave and the medium through which it is passing.	**SE/TE:** Compare Frequency and Wave Speed, 505 Wavelength and Frequency, 535 How Long Does an Antenna Need to Be?, 542 **TE Only:** For Extra Help, 542 Wavelength, Frequency, and Color, 552
Science and Engineering Practice	
Mathematical and Computational Thinking: Use mathematical representations of phenomena or design solutions to describe and/or support claims and/or explanations.	**SE/TE:** Using Scientific Notation, 14 Using Chemical Equations to Represent Reactions, 192 Balancing Equations, 194 Calculating Power, 415 **TE Only:** Counting With Moles, 195 Additional Problems, 415
Crosscutting Concepts	
Cause and Effect: Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.	**SE/TE:** Making Judgements, 20 Figure 10, 200 Figure 6, 395 Figure 6, 418 Figure 19, 548 **TE Only:** Fact and Figures, 79 Customize for Inclusion Students, 241 Relate Cause and Effect, 260D Sequence, 290D Relate Cause and Effect, 395 Relate Cause and Effect, 418
Performance Expectation:	
PS.PS4.2 Evaluate questions about the advantages and disadvantages of using a digital transmission and storage of information.	**SE/TE:** Digital Signals, 619 Figure 17, 619 Digital Camera, 620 **TE Only:** Use Visuals, 619 Comparing and Contrasting, 619

A Correlation of Physical Science: Concepts in Action to the Oklahoma 2020 Academic Standards for Science High School Physical Science

Oklahoma 2020 Academic Standards for Science High School Physical Science	Physical Science Concepts in Action
Disciplinary Core Ideas	
Information can be digitized (e.g., a picture stored as the values of an array of pixels); in this form, it can be stored reliably in computer memory and sent over long distances as a series of wave pulses.	**SE/TE:** Electronic Signals, 618 Digital Signals, 619 Figure 17, 619 Digital Camera, 620 **TE Only:** Use Community Resources, 618 Use Visuals, 619 Comparing and Contrasting, 619 For Enrichment, 620
Modern civilization depends on major technological systems. Engineers continuously modify these technological systems by applying scientific knowledge and engineering design practices to increase benefits while decreasing costs and risks.	**SE/TE:** Genetically Modified Organisms, Modern Miracles or Frankenfoods?, 281 Hybrid Automobile, 488 Digital Camera, 620 Anti-Theft Security Devices, 634 **TE Only:** How It Works, xvi For Enrichment, 620
Science and Engineering Practice	
Asking Questions: Evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.	**SE/TE:** Chapter 17 Assessment, 527 **TE Only:** Evaluate Understanding, 416 Use Community Resources, 576 Evaluate Understanding, 607 Evaluate Understanding, 647 Directed Reading/Thinking Activity (DRTA), 444D
Crosscutting Concepts	
Stability and Change: Systems can be designed for greater or lesser stability.	**SE/TE:** Factors Affecting Chemical Equilibrium, 218 Thermal Contraction and Expansion, 476 Thermal Conductors, 480 Thermal Insulators, 480 Total Internal Reflection, 578 **TE Only:** Think-Pair-Share, 217 Use Visuals, 356 Momentum, 374

A Correlation of Physical Science: Concepts in Action to the Oklahoma 2020 Academic Standards for Science High School Physical Science

Oklahoma 2020 Academic Standards for Science High School Physical Science	Physical Science Concepts in Action
Performance Expectation	
PS.PS4.4 Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	**SE/TE:** 21st Century Learning, 530 **TE Only:** For additional supporting content, please see: Introduction, 532 The Electromagnetic Spectrum, 539–545 New Light on Old Art, 554–557
Disciplinary Core Ideas	
When light or longer wavelength electromagnetic radiation is absorbed in matter, it is generally converted into thermal energy (heat).	**SE/TE:** Radiation, 481 Chapter 16 Assessment, 495 Infrared Ray, 543 **TE Only:** Color, 530D
Shorter wavelength electromagnetic radiation (ultraviolet, X-rays, gamma rays) can ionize atoms and cause damage to living cells.	**SE/TE:** Types of Nuclear Radiation, 293 Figure 4, 294 Nuclear Medicine, 306 X-Rays, 544 Gamma Rays, 545 **TE Only:** Stopping Radiation, 294 Answer to …, 295
Photoelectric materials emit electrons when they absorb light of high enough frequency.	**SE/TE:** Figure 5, 536 Evidence for the Particle Model, 537e **TE Only:** Before you Teach, 530C The Photoelectric Effect, 537 Answer to …, 537

A Correlation of Physical Science: Concepts in Action to the Oklahoma 2020 Academic Standards for Science High School Physical Science

Oklahoma 2020 Academic Standards for Science High School Physical Science	Physical Science Concepts in Action
Science and Engineering Practice	
Obtaining, Evaluating, and Communicating Information: Evaluate the validity and reliability of multiple claims that appear in scientific and technical texts or media reports, verifying the data when possible.	**SE/TE:** Performance-Based Assessment, 496 Going Further, 271 **TE Only:** Classifying, 44 Integrate Health, 266 Integrate Earth Science, 296 For Enrichment, 450 For Enrichment, 488
Crosscutting Concepts	
Cause and Effect: Cause and effect relationships can be suggested and predicted for complex natural and human- designed systems by examining what is known about smaller scale mechanisms within the system.	**SE/TE:** Figure 6, 395 Chapter 19 Assessment, 595 Identifying Cause and Effect, 874 **TE Only:** Relate Cause and Effect, 260D Relate Cause and Effect, 262 Sequence, 290D Relate Cause and Effect, 378 Chapter Pretest, 388 Relate Cause and Effect, 390 Relate Cause and Effect, 395 Relate Cause and Effect, 418 Relate Cause and Effect, 486 Cause/Effect Chart, 571 Relate Cause and Effect, 590