

A Correlation of

Pearson

Physical Science

Concepts in Action



To the

Georgia Standards of Excellence

Physical Science

A correlation of *Pearson Physical Science: Concepts in Action* to the Georgia Standards of Excellence in Physical Science

Introduction

This document demonstrates how ***Physical Science, Concepts in Action*** aligns to the Georgia Standards of Excellence in Physical Science. References are to the Student Edition (SE) and Teacher's Edition (TE).

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. More technology, tools, and activities support differentiated instruction.

- **21st 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**

This digital resource helps you create dynamic presentations with slides, videos, and participatory activities.

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Georgia Standards of Excellence Physical Science	Physical Science: Concepts in Action
SPS1. Obtain, evaluate, and communicate information from the Periodic Table to explain the relative properties of elements based on patterns of atomic structure.	
<p>a. Develop and use models to compare and contrast the structure of atoms, ions and isotopes. <i>(Clarification statement: Properties include atomic number, atomic mass and the location and charge of subatomic particles.)</i></p>	<p>SE/TE: 100-105, 108, 109-112, 113-118 Problem-Solving Activity: 109 Quick Lab: 117 Section 4.3 Assessment: 118 (#2, 5, 7, 8) Forensics Lab: 119 Chapter 4 Assessment: 121 (#2-9, 11-23), 122 (#26-29)</p> <p>TE Only: 98C-98D Teacher Demo: 104, 110, 116 Build Science Skills: 105, 112, 116 Science and History: 115</p>
<p>b. Analyze and interpret data to determine trends of the following:</p> <ul style="list-style-type: none"> • Number of valence electrons • Types of ions formed by main group elements • Location and properties of metals, nonmetals, and metalloids • Phases at room temperature 	<p>SE/TE: 126-129, 130-133, 135-136, 138, 139-145, 159-160 Quick Lab: 135 Chapter 5 Assessment: 153 (#8, 10, 20, 21), 154 (#32, 33),</p> <p>TE Only: 124C-124D Build Science Skills: 131, 133 Teacher Demo: 138</p>
<p>c. Use the Periodic Table as a model to predict the above properties of main group elements.</p>	<p>SE/TE: 135-136, 138, 140-145 Section 5.3 Assessment: 145 (#1, 2, 5, 6, 11, 12) Chapter 5 Assessment: 153 (#6, 7, 9, 17, 18, 22), 154 (#29, 31, 32, 33)</p>

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SPS2. Obtain, evaluate, and communicate information to explain how atoms bond to form stable compounds.	
<p>a. Analyze and interpret data to predict properties of ionic and covalent compounds. <i>(Clarification statement: Properties are limited to types of bonds formed, elemental composition, melting point, boiling point, and conductivity.)</i></p>	<p>SE/TE: 158-159, 160-162, 164, 165-169, 176-181 Data Analysis: 160 Section 6.1 Assessment: 164 (#1-4, 7, 8) Section 6.2 Assessment: 169 (#1-7) Section 6.4 Assessment: 181 (#1-5) Chapter 6 Assessment: 187 (#4, 5, 16-19), 188 (#28, 34)</p> <p>TE Only: 156C-156D Teacher Demo: 168, 169, 177</p>
<p>b. Develop and use models to predict formulas for stable, binary ionic compounds based on balance of charges.</p>	<p>SE/TE: 175 Quick Lab: 173 Math Skills: 174 Section 6.3 Assessment: 175 (#10) Chapter 6 Assessment: 187 (#6, 7, 15, 21), 188 (#31, 32)</p>
<p>c. Use the International Union of Pure and Applied Chemistry (IUPAC) nomenclature for translating between chemical names and chemical formulas. <i>(Clarification statement: Limited to binary covalent and binary ionic, containing main group elements, compounds but excludes polyatomic ions.)</i></p>	<p>SE/TE: 170-172, 174-175 Section 6.3 Assessment: 175 (#2-4, 8, 9) Chapter 6 Assessment: 187 (#7, 20, 22), 188 (#29, 31, 32, 37)</p>

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SPS3. Obtain, evaluate, and communicate information to support the Law of Conservation of Matter.	
<p>a. Plan and carry out investigations to generate evidence supporting the claim that mass is conserved during a chemical reaction. <i>(Clarification statement:</i> Limited to synthesis, decomposition, simple replacement, and double replacement reactions.)</p>	<p>SE/TE: 193, 199-200 Inquiry Activity: 191 Section 7.1 Assessment: 198 (#1) Quick Lab: 203 Section 7.2 Assessment: 205 (#3, 4, 7, 8)</p> <p>TE Only: 190C-190D Teacher Demo: 200 Visual: 202</p>
<p>b. Develop and use a model of a chemical equation to illustrate how the total number of atoms is conserved during a chemical reaction. <i>(Clarification statement:</i> Limited to chemical equations that include binary ionic and covalent compounds and will not include equations containing polyatomic ions.)</p>	<p>SE/TE: 192-195, Math Practice: 195 Section 7.1 Assessment: 198 (#6) Chapter 7 Assessment: 223 (#11, 12), 224 (#28)</p> <p>TE Only: Build Math Skills: 193</p>
SPS4. Obtain, evaluate, and communicate information to explain the changes in nuclear structure as a result of fission, fusion and radioactive decay.	
<p>a. Develop a model that illustrates how the nucleus changes as a result of fission and fusion.</p>	<p>SE/TE: 309-311, 314 Section 10.4 Assessment: 315 (#6) Exploration Lab: 316-317 Chapter 10 Assessment: 319 (#19), 320 (#32) Standardized Test Prep: 321 (#6)</p> <p>TE Only: 290D, Use Visuals: 310 Teacher Demo: 311</p>

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<p>b. Use mathematics and computational thinking to explain the process of half-life as it relates to radioactive decay. <i>(Clarification statement: Limited to calculations that include whole half-lives.)</i></p>	<p>SE/TE: 299-301 Quick Lab: 300 Section 10.2 Assessment: 301 (#7) Chapter 10 Assessment: 319 (#4), 320 (#27-29)</p> <p>TE Only: 290C Teacher Demo: 299 Build Science Skills: 301</p>
<p>c. Construct arguments based on evidence about the applications, benefits, and problems of nuclear energy as an alternative energy source.</p>	<p>SE/TE: 312-313, 314 Chapter 10 Assessment: 319 (#21), 320 (#32)</p> <p>TE Only: Science and History: 312</p>
<p>SPS5. Obtain, evaluate, and communicate information to compare and contrast the phases of matter as they relate to atomic and molecular motion.</p>	
<p>a. Ask questions to compare and contrast models depicting the particle arrangement and motion in solids, liquids, gases, and plasmas.</p>	<p>SE/TE: 68-70, 71-74 Section 3.1 Assessment: 74 (#1-8) Chapter 3 Assessment: 95 (#1, 2, 11-15), 96 (#33)</p> <p>TE Only: 66C Teacher Demo: 69, 72 Build Science Skills: 73, 74</p>
<p>b. Plan and carry out investigations to identify the relationships among temperature, pressure, volume, and density of gases in closed systems. <i>(Clarification statement: Using specific Gas laws to perform calculations is beyond the scope of this standard; emphasis should focus on the conceptual understanding of the behavior of gases rather than calculations.)</i></p>	<p>SE/TE: 75-79, 80-81, 82-83 Quick Lab: 79 Math Practice: 80, 81 Section 3.2 Assessment: 81 (#1-10) Chapter 3 Assessment: 95 (#6, 7, 16-20), 96 (#30-32) Standardized Test Prep: 97 (#4, 5)</p> <p>TE Only: Build Science Skills: 75, 78, 82 Teacher Demo: 76 Build Math Skills: 78, 80</p>

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SPS6. Obtain, evaluate, and communicate information to explain the properties of solutions.	
a. Develop and use models to explain the properties (solute/solvent, conductivity, and concentration) of solutions.	<p>SE/TE: 229-230, 231, 235-236 Section 8.2 Assessment: 239 (#1) Chapter 8 Assessment: 257 (#1, 2)</p> <p>TE Only: Build Science Skills: 230 Teacher Demo: 236</p>
b. Plan and carry out investigations to determine how temperature, surface area, and agitation affect the rate solutes dissolve in a specific solvent.	<p>SE/TE: 213-215, 233-234, 237 Quick Lab: 214 Section 7.4 Assessment: 215 (#1-6, 8) Section 8.1 Assessment: 234 (#4, 5) Problem-Solving Activity: 238 Section 8.2 Assessment: 239 (#2, 4)</p> <p>TE Only: Build Science Skills: 213 Teacher Demo: 213 How It Works: 233 Address Misconceptions: 234</p>
c. Analyze and interpret data from a solubility curve to determine the effect of temperature on solubility.	<p>SE/TE: Chapter 8 Assessment: 258 (#30-32)</p>
d. Obtain and communicate information to explain the relationship between the structure and properties (e.g., pH, and color change in the presence of an indicator) of acids and bases. <i>(Clarification statement: Limited to only the structure of simple acids and bases (e.g., HCl and NaOH) that demonstrates the presence of an H⁺ or OH⁻).</i>	<p>SE/TE: 240-244, 246-249, Quick Lab: 243, 248 Section 8.3 Assessment: 245 (#1-3) Section 8.4 Assessment: 249 (#1-4, 6) Chapter 8 Assessment: 257 (#7, 9, 20, 22), 258 (#28)</p> <p>TE Only: Build Science Skills: 242 Teacher Demo: 244 Use Visuals: 247</p>

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e. Plan and carry out investigations to detect patterns in order to classify common household substances as acidic, basic, or neutral.	SE/TE: Quick Lab: 243 Exploration Lab: 254-255
SPS7. Obtain, evaluate, and communicate information to explain transformations and flow of energy within a system.	
a. Construct explanations for energy transformations within a system. <i>(Clarification statement: Types of energy to be addressed include chemical, mechanical, electromagnetic, light, sound, thermal, electrical, and nuclear.)</i>	SE/TE: 282-283, 312, 314, 450-452, 453-454, 456-457, 464, 484-485 Section 15.1 Assessment: 452 (#4) Quick Lab: 454 How It Works: 465 Chapter 15 Assessment: 469 (#4, 6, 18) Chapter 16 Assessment: 495 (#5, 6, 23), 496 (#25), 518-519 TE Only: Teacher Demo: 456, 464 Build Science Skills: 484
b. Plan and carry out investigations to describe how molecular motion relates to thermal energy changes in terms of conduction, convection, and radiation.	SE/TE: 475-476, 479-481 Inquiry Activity: 473 Quick Lab: 476, 481 Section 16.2 Assessment: 483 (#1-3) TE Only: 472C Teacher Demo: 480
c. Analyze and interpret specific heat data to justify the selection of a material for a practical application (e.g., insulators and cooking vessels).	SE/TE: 476-478, 480 Math Practice: 477 Section 16.1 Assessment: 478 (#5, 8-11) Design Your Own Lab: 493 Chapter 16 Assessment: 496 (#29) TE Only: Teacher Demo: 478
d. Analyze and interpret data to explain the flow of energy during phase changes using heating/cooling curves.	SE/TE: 84-85 Exploration Lab: 92-93

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SPS8. Obtain, evaluate, and communicate information to explain the relationships among force, mass, and motion.	
<p>a. Plan and carry out an investigation and analyze the motion of an object using mathematical and graphical models. <i>(Clarification statement: Mathematical and graphical models could include distance, displacement, speed, velocity, time and acceleration.)</i></p>	<p>SE/TE: 329, 330-331, 332-334, 336-337, 342-348, Inquiry Activity: 327 Quick Lab: 330 Section 11.1 Assessment: 331 (#2, 3, 5-8) Math Practice: 333, 346 Section 11.2 Assessment: 337 (#1-9) Section 11.3 Assessment: 348 (#1-7) Exploration Lab: 349 Chapter 11 Assessment: 351 (#1, 2, 4), 352 (#25-34)</p> <p>TE Only: 326C-326D Build Science Skills: 331, 332, 340, 345 Teacher Demo: 334, 344 Build Math Skills: 334, 347 Build Reading Literacy: 336 Use Visuals: 337, 342, 347 Integrate Math: 348</p>
<p>b. Construct an explanation based on experimental evidence to support the claims presented in Newton’s three laws of motion. <i>(Clarification statement: Evidence could demonstrate relationships among force, mass, velocity, and acceleration.)</i></p>	<p>SE/TE: 356-358, 364-365, 367-369, 373-377 Inquiry Activity: 355 Quick Lab: 365 Math Practice: 367 Section 12.2 Assessment: 369 (#1-7) Data Analysis: 377 Exploration Lab: 383 Chapter 12 Assessment: 385 (#5, 7, 8, 19), 386 (#27)</p> <p>TE Only: 354C-354D Build Science Skills: 357, 364 Use Visuals: 364, 369 Teacher Demo: 365</p>

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c. Analyze and interpret data to identify the relationship between mass and gravitational force for falling objects.	<p>SE/TE: 380-382 Section 12.4 Assessment: 382 (#3, 5-7) Chapter 12 Assessment: 385 (#6, 17, 23), 386 (#33)</p> <p>TE Only: Facts and Figures: 380 Build Science Skills: 381</p>
d. Use mathematics and computational thinking to identify the relationships between work, mechanical advantage, and simple machines.	<p>SE/TE: 412-414, 417-420, 421-423, 424-426, 427-429, 430-433 Inquiry Activity: 411 Section 14.2 Assessment: 420 (#1-8) Quick Lab: 424, 429 Math Practice: 425 Section 14.3 Assessment: 426 (#1-9) Data Analysis: 433 Section 14.4 Assessment: 435 (#1-9) Consumer Lab: 438-439 Chapter 14 Assessment: 441 (#1-10, 14-21), 442 (#22, 24-32)</p> <p>TE Only: 410C-410D Teacher Demo: 413, 423, 430 Build Science Skills: 423, 430, 432 Build Math Skills: 426 Use Visuals: 432</p>

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SPS9. Obtain, evaluate, and communicate information to explain the properties of waves.	
a. Analyze and interpret data to identify the relationships among wavelength, frequency, and energy in electromagnetic waves and amplitude and energy in mechanical waves.	<p>SE/TE: 500-503, 507, 533-535 Inquiry Activity: 499 Quick Lab: 502 Section 17.1 Assessment: 503 (#1) Section 17.2 Assessment: 507 (#3) Math Practice: 535 Section 18.1 Assessment: 538 (#3) Chapter 18 Assessment: 565 (#1, 3)</p> <p>TE Only: 498C-498D, 530C Use Visuals: 533 Build Reading Literacy: 534</p>
b. Ask questions to compare and contrast the characteristics of electromagnetic and mechanical waves.	<p>For supporting content, please see: SE/TE: 500, 533, 535, 539-540 Quick Lab: 505</p> <p>TE Only: 498C Build Science Skills: 500 Use Visuals: 533</p>
c. Develop models based on experimental evidence that illustrate the phenomena of reflection, refraction, interference, and diffraction.	<p>For supporting content, please see: SE/TE: 508-511, 547-548 Section 17.3 Assessment: 512 (#1-4, 6-8) Chapter 17 Assessment: 527 (#5, 6)</p> <p>TE Only: Use Visuals: 510, 511 Facts and Figures: 516 Teacher Demo: 547</p>
d. Analyze and interpret data to explain how different media affect the speed of sound and light waves.	<p>SE/TE: 514, 533, 534, 574-575 Chapter 17 Assessment: 527 (#16) Data Analysis: 575</p>

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e. Develop and use models to explain the changes in sound waves associated with the Doppler Effect.	<p>SE/TE: 516, 542</p> <p>TE Only: Use Visuals: 516</p>
SPS10. Obtain, evaluate, and communicate information to explain the properties of and relationships between electricity and magnetism.	
a. Use mathematical and computational thinking to support a claim regarding relationships among voltage, current, and resistance.	<p>SE/TE: 604-607 Quick Lab: 606 Section 20.2 Assessment: 607 (#1-8) Chapter 20 Assessment: 625 (#6), 626 (#27-30)</p> <p>TE Only: 598C-598D Use Visuals: 604 Build Science Skills: 607</p>
b. Develop and use models to illustrate and explain the conventional flow (direct and alternating) of current and the flow of electrons in simple series and parallel circuits. (<i>Clarification statement:</i> Advantages and disadvantages of series and parallel circuits should be addressed.)	<p>SE/TE: 604 (Figure 7), 609-610 Section 20.3 Assessment: 613 (#2) Chapter 20 Assessment: 625 (#16-18) Standardized Test Prep: 627 (#1)</p> <p>TE Only: Teacher Demo: 610 Use Visuals: 610</p>
c. Plan and carry out investigations to determine the relationship between magnetism and the movement of electrical charge. (<i>Clarification statement:</i> Investigations could include electromagnets, simple motors, and generators.)	<p>SE/TE: 635-636, 637-639, 642-644 Quick Lab: 637 Application Lab: 648-649</p> <p>TE Only: 628C-628D Teacher Demo: 636, 638, 643 Build Science Skills: 639, 642</p>