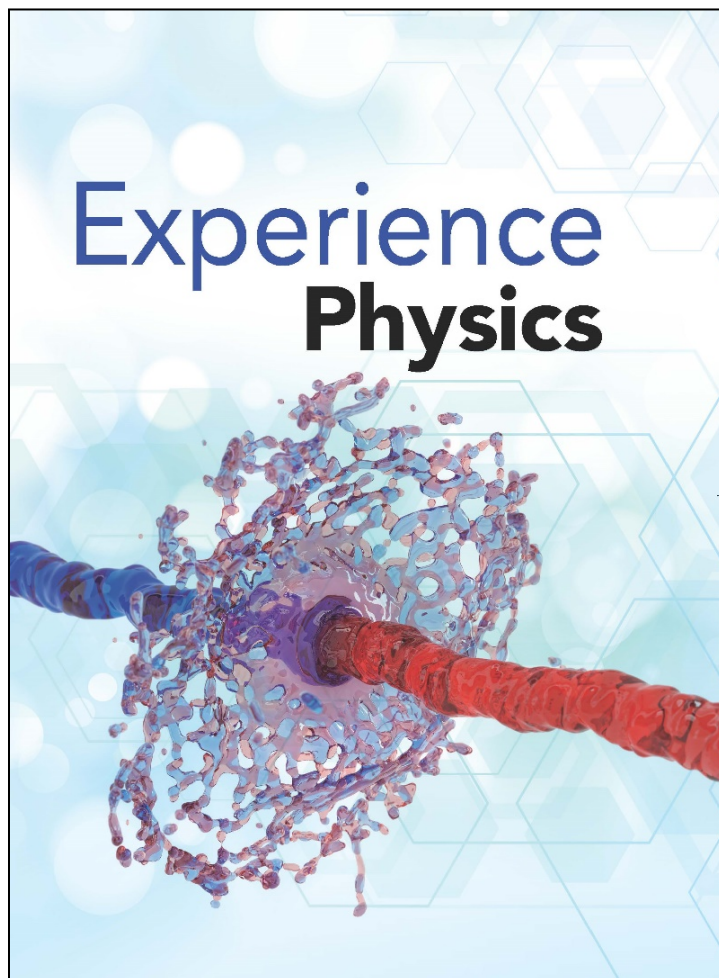


A Correlation of



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To the

**California Education and the
Environment Initiative
Environmental Principles & Concepts**

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Introduction

This document demonstrates how **Experience Physics** ©2022 supports the California Education and the Environment Initiative, Environmental Principles & Concepts. Correlation references include the Experience Notebook, Teacher Guide, and online digital assets.

Savvas Learning Company is excited to introduce **Experience Physics**!

Students best learn science when they *do* science! Therefore **Experience Physics** puts the focus on the student experience. This modern program implements a learning model that organizes learning around phenomena giving students an authentic, real-world experience. **Experience Physics** includes a variety of hands-on and digital activities designed to reach every learner, and partners with Flinn Scientific to deliver high-quality inquiry labs, engineering workbenches, and performance assessments.

Phenomenal Experiences Begin with a relevant and engaging phenomenon. Learning is organized around learning around phenomena, giving students an authentic, real-world experience. **Experience Physics** includes a variety of hands-on and digital activities designed to reach every learner, encouraging students to ask and answer questions, gather evidence, and organize their reasoning as they experience the concepts of physics firsthand.

Flinn Scientific Partnership Labs, Engineering Workbenches, dataset activities, and performance tasks enhance the student experience and encourage your class to do more science! Hands-on inquiry labs are available in open-ended, guided, shortened, and advanced versions, perfect for meeting the needs of every student.

Personalize Instruction The Teacher Guide allows instructors to personalize their course by selecting from our activities or embedding their own. Enhance instructional plan with Got More Time? Activities, or substitute with Related Phenomena when you want to make a change! Additionally, storyline and Investigation Planners use the 5E model to streamline your prep time.

Build Mathematical Fluency Stepped-out examples in the Experience Handbook break down sample problems for clarity and process guidance, while math tutorial videos reinforce mathematical processes. The Physics and Math Skills Workbook includes four pages of review and practice problems for every learning experience. These activities and more guide students as they become more proficient with math and physics concepts.

Savvas Realize™ Award-Winning Digital Platform Access all your digital content, virtual labs, simulations, assessments, and student data in ONE location. Savvas Realize has offline accessibility, so students can study from anywhere.

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California Education and the Environment Initiative's Environmental Principles & Concepts	Experience Physics ©2022
Principle 1 - People Depend on Natural Systems	
The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services.	
<p>Concept A. The goods produced by natural systems are essential to human life and to the functioning of our economies and cultures.</p>	<p>Student Experience Notebook: SEP Design a Solution, 409 Human Use of Energy, 445 Human Power Needs, 449 CCC Cause and Effect, 454 SEP Argue from Evidence, 455 SEP Construct an Argument, 459 SEP Defend Your Claim, 599</p> <p>Teacher Guide: Engineering Workbench: Landslide Prevention Inquiry Labs: Converting Sunlight to Electricity, Natural Resource Management</p>
<p>Concept B. The ecosystem services provided by natural systems are essential to human life and to the functioning of our economies and cultures.</p>	<p>Student Experience Notebook: SEP Construct an Explanation, 103 Elastomers, 272-273 Human Use of Energy, 445 CCC Cause and Effect, 454 SEP Construct an Argument, 459</p> <p>Teacher Guide: Elaborate: Energy Choices, 271 Digital Activities: Resource Use and Biodiversity Trade Offs, Operate a Nuclear Fission Reactor Engineering Workbench: Energy Sources: Costs and Benefits, Energy Production Performance-Based Assessment: Design, Build and Refine a Wind-Turbine Rotor</p>

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<p>Concept C. That the quality, quantity, and reliability of the goods and ecosystem services provided by natural systems are directly affected by the health of those systems.</p>	<p>Student Experience Notebook: SEP Construct an Explanation, 103 SEP Design a Solution, 109 CCC Cause and Effect, 409 Impacts on the Biosphere, 447 Impact Reduction, 448 Costs and Benefits, 452 Costs and Benefits of Renewable Energy, 453 Costs and Benefits: Oil, Gas, and Coal, 454 Costs and Benefits: Wind, Solar, and Biomass, 455 Costs and Benefits: Hydroelectric, Geothermal, Tides, and Waves, 456 Costs and Benefits: Nuclear Power, 457 Sustainable Energy Future, 458 SEP Argue from Evidence, 460 SEP Construct an Explanation, 460 SEP Communicate Information, 461 CCC Energy and Matter, 535</p> <p>Teacher Guide: Landslide Prevention, 61 Integrate Other Domains: Live Science, 87 Digital Activities: Resource Use and Biodiversity Trade Offs, Operate a Nuclear Fission Reactor Engineering Workbench: Energy Sources: Costs and Benefits, Energy Production Inquiry Labs: Natural Resource Management Performance-Based Assessment: Design, Build and Refine a Wind-Turbine Rotor</p>

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Principle 2 - People Influence Natural Systems	
The long-term functioning and health of terrestrial, freshwater, coastal, and marine ecosystems are influenced by their relationships with human societies.	
<p>Concept A. Direct and indirect changes to natural systems due to the growth of human populations and their consumption rates influence the geographic extent, composition, biological diversity, and viability of natural systems.</p>	<p>Student Experience Notebook: Human Use of Energy, 446 SEP Use Mathematics, 446 SEP Analyze Data, 446 Impacts on the Biosphere, 447 CCC Cause and Effect, 448 Impact Reduction, 448 Annual Supply and Demand Variations, 450 Daily Variations in Supply and Demand, 450 Costs and Benefits, 452 Changes in U. S. Generating Capacity Since 2009, 454 Levelized Cost of Energy Sources, 455 The Success of U. S. Environmental Regulations, 458</p> <p>Teacher Guide: Integrate Other Domains: Life Science, 87 Evaluate: Investigative Phenomenon: Stability and Change, 218 Energy Resources and Conservation, 269 Sample Problem: Math Support, 270 Elaborate: Skills in Energy Resources and Conservation, 271 Remediation Suggestions, 272</p> <p>Digital Activity: Resource Use and Biodiversity Tradeoffs, A Guide to the Energy of Earth</p> <p>Engineering Workbench: Energy Sources: Costs and Benefits</p> <p>Inquiry Lab: Natural Resource Management</p>

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<p>Concept B. Methods used to extract, harvest, transport, and consume natural resources influence the geographic extent, composition, biological diversity, and viability of natural systems.</p>	<p>Student Experience Notebook: SEP Construct an Explanation, 103 SEP Design a Solution, 109 Elastomers, 272-273 SEP Design a Solution, 409 Energy Resources and Conservation, 445 SEP Use Mathematics, 446 SEP Analyze Data, 446 Impacts on the Biosphere, 447 Impact Reduction, 448 U.S. energy Sources and Uses, 449-450 Costs and Benefits, 452-457 The Success of Environmental Regulations, 458 Go Online: Sustainable Energy Sources, 459 SEP Design a Solution, 492 CCC Energy and Matter, 535 SEP Defend Your Claim, 599</p> <p>Teacher Guide: Energy Resources and Conservation, 266 Explore: Resource Use and Biodiversity Trade-Offs, 267 Assess On The Spot, 270 Digital Activity: Resource Use and Biodiversity Tradeoffs</p> <p>Engineering Workbench: Energy Sources: Costs and Benefits, Landslide Prevention Inquiry Lab: Natural Resource Management Performance-Based Assessment: Design, Build and Refine a Wind-Turbine Rotor</p>

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<p>Concept C. The expansion and operation of human communities influences the geographic extent, composition, biological diversity, and viability of natural systems.</p>	<p>Student Experience Notebook: SEP Use Mathematics, 446 SEP Analyze Data, 446 CCC Cause and Effect, 448 Impact Reduction, 448 Annual Supply and Demand Variations, 450 Daily Variations in Supply and Demand, 450 Changes in U. S. Generating Capacity Since 2009, 454 Levelized Cost of Energy Sources, 455 The Success of U. S. Environmental Regulations, 458</p> <p>Teacher Guide: Integrate Other Domains: Life Science, 87 Evaluate: Investigative Phenomenon: Stability and Change, 218 Professional Development: Inspire Your Students Digital Activity: Resource Use and Biodiversity Tradeoffs Engineering Workbench: Energy Sources: Costs and Benefits Inquiry Lab: Natural Resource Management</p>
<p>Concept D. The legal, economic, and political systems that govern the use and management of natural systems directly influence the geographic extent, composition, biological diversity, and viability of natural systems.</p>	<p>Student Experience Notebook: CCC Patterns, 420 Energy Use, Population, and Impact, 446 Impacts on the Biosphere, 447 Impact Reduction, 448 Human Power Needs, 449-450 Costs and Benefits, 452 Costs and Benefits of Renewable Energy, 453 Costs and Benefits: Oil, Gas, and Coal, 454 Costs and Benefits: Wind, Solar, and Biomass, 455 Costs and Benefits: Hydroelectric, Geothermal, Tides, and Waves, 456 Costs and Benefits: Nuclear Power, 457 The Success of U. S. Environmental Regulations, 458 Energy from the Sun, 558</p> <p>Teacher Guide: Natural Resource Management, 267 Energy Resources and Conservation, 269 Integrate Other Domains: Environmental Science Inquiry Lab: Natural Resource Management</p>

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Principle 3 - Natural Systems Change in Ways that People Benefit From and Can Influence Natural systems proceed through cycles that humans depend upon, benefit from, and can alter.	
<p>Concept A. Natural systems proceed through cycles and processes that are required for their functioning.</p>	<p>Student Experience Notebook: Rock and Water Cycles, 96 What causes the Seasons?, 114 The Earth-Sun System, 136 The Earth-Moon System, 137 Tides and Tidal Forces, 139 Subduction Zone Volcanoes, 357 Costs and Benefits of Renewable Energy, 453 The Oldest Rocks on Earth, 629 Formation of Earth and the Moon, 633 Impact Craters and Solar System History, 634 Continuous vs. Catastrophic, 638 Sea Level Changes, 641–642 Geologic Time Divisions, 644 Ages of Ocean Crust, 646–647 Life Cycle of Stars, 672</p> <p>Teacher Guide: Integrate Math, 57 Forces at a Distance: Points of Integration, 64 Collisions in Earth's Crust, 215 Encounter: Investigate Phenomenon: How will the sun change over time?, 406 Stars: Related Phenomena, 414 Integrate The Three Dimensions, 415</p> <p>Inquiry Lab: Sunlight Intensity and Solar Flares Performance-Based Assessment: Life Cycle of Stars Virtual Lab Performance-Based Assessment: Star Life Cycle</p>

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<p>Concept B. Human practices depend upon and benefit from the cycles and processes that operate within natural systems.</p>	<p>Student Experience Notebook: Natural and Synthetic Polymers, 271 Elastomers, 272 Transferring Energy Through Heating, 374–375 The First Law of Thermodynamics, 376 CCC Systems and System Models, 380 The Second Law of Thermodynamics, 384–385 Thermodynamic Heat Engines, 386–387 Heat Pumps, 390–391 Heat Engine Efficiency, 392–393 Cost and Benefits of Renewable Energy, 453 Transfer of Wave Energy, 488–489 Energy in Waves, 490–492 Fusion and Sunlight, 655 The Sun's Fusion, 656 Energy in the Sun's Fusion Processes, 657 Transfer of Fusion Energy, 658–659 Nuclear Fusion Within Stars, 674–675</p> <p>Teacher Guide: Digital Activity: Build a Star!, PhET Simulation Inquiry Lab: Converting Electrical Signals to Sounds Performance-Based Assessment: Send Messages with a Telegraph</p>

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<p>Concept C. Human practices can alter the cycles and processes that operate within natural systems.</p>	<p>Student Experience Notebook: SEP Construct an Explanation, 103 Homans as a Geologic Force, 109 CCC Stability and Change, 110 SEP Design a Solution, 409 Energy Use, Population, and Impact, 446 Impacts on the Biosphere, 447 Impact Reduction, 448 Energy Storage Technologies, 451 Changes in U. S. Generating Capacity Since 2009, 454 Sustainable Energy Future, 458–459 SEP Defend Your Claim, 599</p> <p>Teacher Guide: Evaluate: Investigative Phenomenon, 60 Related Phenomena: Energy for Transportation, 266 Differentiated Instruction: Support Special Needs Students, 268 Integrate The Three Dimensions, 269 Digital Activities: PhET Simulation: Energy, Operate a Nuclear Fission Reactor, Fission and Fusion, Generator Testing, Resources and Conservation, Solar Panels on a Cloudy Day, Resource Use and Biodiversity Tradeoffs Engineering Workbench: Earthquake-Resistant Structures Inquiry Lab: Natural Resource Management</p>

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Principle 4 - There Are No Permanent or Impermeable Boundaries that Prevent Matter from Flowing Between Systems	
The exchange of matter between natural systems and human societies affects the long-term functioning of both.	
<p>Concept A. The effects of human activities on natural systems are directly related to the quantities of resources consumed and to the quantity and characteristics of the resulting byproducts.</p>	<p>Student Experience Notebook: SEP Construct an Explanation, 103 Engineering Workbench, 153 Human Use of Energy, 445–446 How Energy Use Impacts Biodiversity, 447 CCC Cause and Effect, 447 Human Power Needs, 449-450 Energy Storage Technologies, 451 Costs and Benefits, 452 Costs and Benefits of Renewable Energy, 453 Costs and Benefits: Oil, Gas, and Coal, 454 Costs and Benefits: Wind, Solar, and Biomass, 455 Costs and Benefits: Nuclear Power, 456 Sustainable Energy Future, 458–459 CCC Construct an Explanation, 460 Waves, 465 SEP Construct an Explanation, 492 Energy from the Sun, 558</p> <p>Teacher Guide: Evaluate: Investigative Phenomenon, 265 Explore: Natural Resource Management, 267 Explain: Professional Development, 268 Integrate Other Domains: Environmental Science, 271</p> <p>Digital Activities: Resource Use and Biodiversity Trade Offs, Operate a Nuclear Fission Reactor Performance-Based Assessment: Design, Build and Refine a Wind-Turbine Rotor</p>

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<p>E. The byproducts of human activity are not readily prevented from entering natural systems and may be beneficial, neutral, or detrimental in their effect.</p>	<p>Student Experience Notebook: SEP Construct an Explanation, 103 Earth and Human Activity, 109 SEP Design a Solution, 409 How Energy Use Impacts Biodiversity, 447 CCC Cause and Effect, 447 Energy Storage Technologies, 451 Costs of Fossil Fuels, 452 Costs and Benefits: Oil, Gas, and Coal, 454 Costs and Benefits: Wind, Solar, and Biomass, 455 Costs and Benefits: Nuclear Power, 456 Costs and Benefits: Hydroelectric, Geothermal, Tides, and Waves, 457 CCC Stability and Change, 458 CCC Construct an Explanation, 460 CCC Energy and Matter, 535</p> <p>Teacher Guide: Professional Development, 56 Explore: Energy Resources and Conservation, 267 Explain: Professional Development, 268 Evaluate: Remediation Suggestions, 272</p> <p>Digital Activities: Resource Use and Biodiversity Trade Offs, Operate a Nuclear Fission Reactor</p> <p>Engineering Workbench: Energy Sources: Costs and Benefits, Energy Production</p>
<p>Concept C. The capacity of natural systems to adjust to human-caused alterations depends on the nature of the system as well as the scope, scale, and duration of the activity and the nature of its byproducts.</p>	<p>Student Experience Notebook: SEP Construct an Explanation, 103 Humans as a Geologic Force, 109 CCC Stability and Change, How Energy Use Impacts Biodiversity, 447 SEP Construct an Argument, 459 CCC Energy and Matter, 535</p> <p>Teacher Guide: Digital Activities: Resource Use and Biodiversity Trade Offs, Operate a Nuclear Fission Reactor</p> <p>Engineering Workbench: Landslide Prevention</p>

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Principle 5 - Decisions Affecting Resources and Natural Systems are Complex and Involve Many Factors	
Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes.	
<p>Concept A. There is a spectrum of what is considered in making decisions about resources and natural systems and how those factors influence decisions.</p>	<p>Student Experience Notebook: Energy Use, Population, and Impact, 446 Impacts on the Biosphere, 447 Impact Reduction, 448 Costs and Benefits, 452 Costs and Benefits of Renewable Energy, 453 Costs and Benefits: Oil, Gas, and Coal, 454 Costs and Benefits: Wind, Solar, and Biomass, 455 Costs and Benefits: Hydroelectric, Geothermal, Tides, and Waves, 456 Costs and Benefits: Nuclear Power, 457 Sustainable Energy Future, 458–459 SEP Argue from Evidence, 460 Energy from the Sun, 558 Sea Level Changes, 641</p> <p>Teacher Guide: Elaborate: Skills in Energy Resources and Conservation, 271 Digital Activities: Energy Choices, Resource Use and Biodiversity Tradeoffs Engineering Workbench: Energy Sources: Costs and Benefits Inquiry Lab: Natural Resource Management</p>

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<p>Concept B. The process of making decisions about resources and natural systems, and how the assessment of social, economic, political, and environmental factors has changed over time.</p>	<p>Student Experience Notebook: Vocabulary, 309 Human Use of Energy, 445 Human Power Needs, 449-450 Energy Storage Technologies, 451 Costs and Benefits, 452 Costs and Benefits of Renewable Energy, 453 CCC Cause and Effect, 454 Sustainable Energy Future, 458–459 SEP Argue from Evidence, 460 SEP Construct an Explanation, 460 Energy from the Sun, 558</p> <p>Teacher Guide: Elaborate: Skills in Inducing Current, 135 Related Phenomena, 170 Explore: Natural Resource Management, 267 Explain: A Guide to the Energy of Earth, 268 Integrate The Three Dimensions, 269 Elaborate: Skills in Energy Resources and Conservation, 271 Elaborate: Skills in Geologic Time, 401 Digital Activities: Energy Choices, Resource Use and Biodiversity Tradeoffs Engineering Workbench: Energy Sources: Costs and Benefits Inquiry Lab: Natural Resource Management</p>