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A Correlation of

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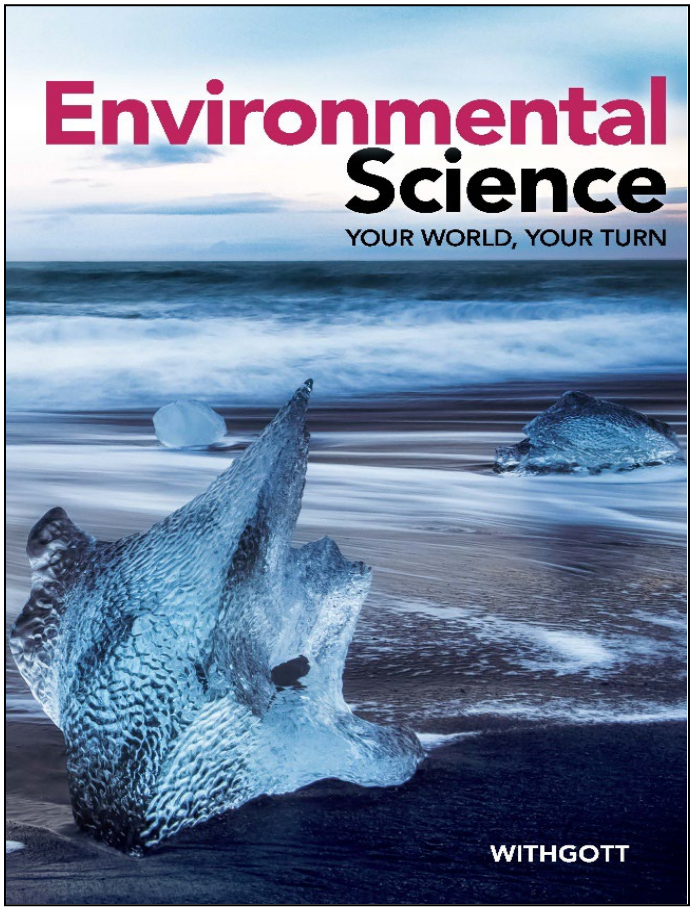

To the

Milwaukee Public Schools Instructional Units for Environmental Science

Prepared by Savvas Learning Company, formerly Pearson K12 Learning

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To the
Milwaukee Public Schools Instructional Units for Environmental Science

Introduction

This document demonstrates how ***Environmental Science: Your World, Your Turn ©2021*** supports the Milwaukee Public Schools Instructional Units for Environmental Science. References are to the Student and Teacher editions and are cited at the page level.

Environmental Science: Your World, Your Turn combines high-interest, real-world content with cutting-edge digital support and a variety of hands-on inquiry investigations to help ensure student success in environmental science. Phenomena drives student engagement through unit level Anchoring Phenomena, Claim Evidence Reasoning, Modeling Activities and Problem-Based learning projects. Acclaimed author and active researcher Jay Withgott shows students why learning environmental science is vital. Students dive deeper with 19 Investigative Phenomena Case Studies. These authentic, real-world applications of environmental science excite students and inspire their passion for the environment.

Anchoring Phenomenon: Launch every unit with an engaging Anchoring Phenomenon that introduces and unifies the upcoming environmental science concepts. Students track their knowledge throughout the unit in a Claims-Evidence-Reasoning or Modeling document and build understanding with an Anchoring Phenomenon Project.

Case Studies Drive Learning: Introduce every chapter with an Investigative Phenomenon Case Study. This engaging real-world case encourages students to draw connections between environmental science and their life while providing a storyline for students to follow. Students “Defend Their Case” at the end of the chapter.

Hands-on Inquiry: Editable hands-on inquiry activities, including labs, Take it Local, Real Data math practice, and Claim-Evidence- Reasoning documents support student understanding of the phenomenon under study.

Student Centered Experience: Facts, questions, and thought-provoking scenarios including Make a Difference, Find out More, and What Do You Think? appear throughout the book, empowering students to apply the science, make choices, and interact with content.

Award-Winning Digital Platform: Access all of your digital content, inquiry labs, planning materials, assessments, and student data in ONE location. The Savvas Realize™ digital platform includes offline capabilities, integration with learning management systems and editable documents and assessments. Our fully digital programs and e-books provide cutting-edge online instruction with a seamless transition from the textbook, allowing students to complete assignments, access videos and activities, and take online tests and remediation.

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Disciplinary Core Ideas	
Cycles of Matter and Energy Transfer in Ecosystems	
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Ecosystem Dynamics, Functioning, and Resilience	
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Engaging in Argument from Evidence	
• Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.	For supporting content, please see: **SE/TE:** The Cloudless Forest, 118-119 Write About It, 119 Chapter 4 Assessment, #34, 123 Investigative Phenomenon, 213
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Adaptation	
• Evolution is a consequence of the interaction of four factors: (1) the potential for a species to increase in number, (2) the genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for an environment's limited supply of the resources that individuals need in order to survive and reproduce, and (4) the ensuing proliferation of those organisms that are better able to survive and reproduce in that environment.	**SE/TE:** Figure 2: Natural Selection, 128-129 Conditions of Natural Selection, 128-129 Character Displacement, 135 Chapter 5 Assessment, #34, 161
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Constructing Explanations and Designing Solutions	
• Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	**SE/TE:** Lesson 1 Assessment, #3, 132 Chapter 5 Assessment, #34, 161
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• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.	**SE/TE:** Chapter 5 Assessment, #34, 161 Chapter 7 Assessment, #34, 223
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• Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	**SE/TE:** Lesson 1 Assessment, #1, #3, 132 Lesson 1 Assessment, #3, 167
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• Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments.	**SE/TE:** Chapter 7 Assessment, #28, 223

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• Develop a model based on evidence to illustrate the relationships between systems or between components of a system.	**SE/TE:** Figure 7: Water Molecule, 69 Figure 12: Negative Feedback Loop, 73 Figure 13: Positive Feedback Loop, 74 Figure 19: The Water Cycle, 81 Figure 21: Carbon Cycle, 84
Planning and Carrying Out Investigations	
• Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.	**SE/TE:** Quick Lab: How Does the Hot Water Move?, 459

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UNIT 7: Natural Resources and Energy	
Essential Questions	
How do humans depend on Earth's resources?	**SE/TE:** 1.1: Our Island, Earth, 4-11 8.1: Trends in Human Population Growth, 228-233 8.3: People and Their Environments, 242-247 11.1: Resource Management, 324-329 11.2: Forests and Their Resources, 330-336 14.2: Uses of Fresh Water, 426-434 17.2: Fossil Fuels, 522-528
How do Earth's surface processes and human activities affect each other?	**SE/TE:** 12.1: Soil, 352-357 12.2: Soil Degradation and Conservation, 358-364 13.1: Minerals and Rocks, 392-397 13.3: Mining Impacts and Regulation, 405-411 14.1: Earth: The Water Planet, 420-425 14.2: Uses of Fresh Water, 426-434 18.2: Hydropower and Ocean Energy, 556-560
What is the process for developing potential design solutions?	**SE/TE:** 14.2: Uses of Fresh Water, 426-434 17.4: Nuclear Power, 536-541 18.1: Biomass and Geothermal Energy, 550-555 18.2: Hydropower and Ocean Energy, 556-560 18.3: Solar and Wind Energy, 561-569 18.4: Energy From Hydrogen, 570-573
Performance Expectations	
HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources has influenced human activity.	**SE/TE:** Human Population Growth, 8 The Tragedy of the Commons, 11 Lesson 1 Assessment, #3, 11 History of Human Population Growth, 228-229 Negative Impacts, 247 Transportation and Urbanization, 294 Find Out More, 294 Environmental Damage and Conflicts, 408

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HS-ESS3-2: Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.	**SE/TE:** Mining Methods, 399-402 Investigative Phenomenon, 400 Responsible Mineral Use, 411 Lesson 3 Assessment, #4, 411 Chapter 13 Assessment, #35, 417 Find Out More, 524 New Sources of Fossil Fuels, 528 Lesson 2 Assessment, #6, 528 Energy Conservation, 535 Lesson 3 Assessment, #5, 535 Benefits and Costs of Nuclear Power, 539-540 Lesson 4 Assessment, #5, 541 Using Coal to Generate Electricity, 542-543 Chapter 17 Assessment, #39, 547 What Do You Think?, 553 Investigative Phenomenon, 554 Benefits and Costs of Geothermal Energy, 555 Lesson 1 Assessment, #4, 555 Investigative Phenomenon, 558 Benefits and Costs of Hydropower, 558-559 Benefits and Costs of Solar Power, 565-566 Investigative Phenomenon, 566 Benefits and Costs of Wind Power, 568-569 Benefits and Costs of Energy from Hydrogen, 572 Lesson 4 Assessment, #3, 573 Are Biofuels Better For the Environment?, 574-575 Chapter 18 Assessment, #37, 579
Disciplinary Core Ideas	
Natural Resources	
• Resource availability has guided the development of human society.	**SE/TE:** Renewable or Nonrenewable?, 7 Human Population Growth, 8 History of Human Population Growth, 228-229 Lesson 1 Assessment, #1, 233 Chapter 8 Assessment, #35, 253

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• All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors.	**SE/TE:** Negative Impacts of Mining, 405-408 Surface Mining Control and Reclamation Act (1977), 410 Advantages of Coal, 524 Find Out More, 524 Pollution from Fossil Fuels, 530-531 Damage Caused by Extracting Fuels, 532-533 Benefits and Costs of Nuclear Power, 539-540 Benefits of Biomass Energy, 553 Benefits and Costs of Geothermal Energy, 555 Benefits and Costs of Hydropower, 558-559 Tidal Energy, 559-560 Benefits and Costs of Solar Power, 565-566 Benefits and Costs of Wind Power, 568-569 Benefits and Costs of Energy from Hydrogen, 572
Developing Possible Solutions	
• When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.	**SE/TE:** Damage Caused by Extracting Fuels, 532-533 Benefits and Costs of Nuclear Power, 539-540 Benefits of Biomass Energy, 553 Defend Your Case, 545 Benefits and Costs of Geothermal Energy, 555 Benefits and Costs of Hydropower, 558-559 Benefits and Costs of Solar Power, 565-566 Benefits and Costs of Wind Power, 568-569 Benefits and Costs of Energy from Hydrogen, 572
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:** Find Out More, 294 Investigative Phenomenon, 532 Chapter 17 Assessment, #30, 546 Reading Checkpoint, 553 Lesson 1 Assessment, #1, 555 Chapter 18 Assessment, #28, #32, 578-579
Influence of Science, Engineering, and Technology on Society and the Natural World	
• Modern civilization depends on major technological systems.	**SE/TE:** Impacts of Technology, 246-247 Diverting Water, 428 Dams, 428-429 How Energy Is Used, 521 How Petroleum is Used, 525 Figure 10: Consumption of Fossil Fuels, 527 Dependence on Foreign Sources, 534

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• Engineers continuously modify these technological systems by applying scientific knowledge and engineering design practices to increase benefits while decreasing costs and risks.	**SE/TE:** Nuclear Fusion: The Future, 541 21st Century Skills, 543 Benefits and Costs of Energy From Hydrogen, 572 Lesson 4 Assessment, #3, 573
• Analysis of costs and benefits is a critical aspect of decisions about technology.	**SE/TE:** Damage Caused by Extracting Fuels, 532-533 Benefits and Costs of Nuclear Power, 539-540 Defend Your Case, 545 Benefits of Biomass Energy, 553 Benefits and Costs of Geothermal Energy, 555 Benefits and Costs of Hydropower, 558-559 Benefits and Costs of Solar Power, 565-566 Benefits and Costs of Wind Power, 568-569 Benefits and Costs of Energy from Hydrogen, 572
Science and Engineering Practices	
Constructing Explanations and Designing Solutions	
• Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	**SE/TE:** Lesson 1 Assessment, #1, 233 Find Out More, 294 Lesson 2 Assessment, #6, 528 Lesson 1 Assessment, #3, 555 Lesson 2 Assessment, #2, #4, 560 Chapter 18 Assessment, #36, 579
Engaging in Arguments from Evidence	
• Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and logical arguments regarding relevant factors (e.g., economic, societal, environmental, ethical considerations).	**SE/TE:** Investigative Phenomenon, 407 Lesson 3 Assessment, #4, 411 Chapter 13 Assessment, #35, 417 Interpret Graphs, 527 Lesson 2 Assessment, #6, 528 Lesson 3 Assessment, #5, 535 Lesson 4 Assessment, #5, 541 21st Century Skills, 543 What Do You Think?, 553 Lesson 1 Assessment, #4, 555 Lesson 4 Assessment, #3, 573 21st Century Skills, 575 Chapter 18 Assessment, #37, 579

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UNIT 8: Human Impact	
Essential Questions	
How do humans change the planet?	**SE/TE:** 3.4: Biogeochemical Cycles, 83-89 7.2: Extinction and Biodiversity Loss, 207-211 8.3: People and Their Environments, 242-247 11.2: Forests and Their Resources, 330-336 12.2: Soil Degradation and Conservation, 358-364 13.3: Mining Impacts and Regulation, 405-411 16.2: Climate Change, 491-496 17.3: Consequences of Fossil Fuel Use, 529-535
How do Earth's surface processes and human activities affect each other?	**SE/TE:** 3.3: Earth's Spheres, 76-82 12.1: Soil, 352-357 12.2: Soil Degradation and Conservation, 358-364 13.1: Minerals and Rocks, 392-397 13.3: Mining Impacts and Regulation, 405-411 14.1: Earth: The Water Planet, 420-425 14.2: Uses of Fresh Water, 426-434
What is the process for developing potential design solutions?	**SE/TE:** 7.3: Protecting Biodiversity, 212-217 10.3: Sustainable Cities, 305-313 11.1: Resource Management, 324-329 14.2: Uses of Fresh Water, 426-434 16.4: Responding to Climate Change, 502-507 18.1: Biomass and Geothermal Energy, 550-555 18.2: Hydropower and Ocean Energy, 556-560 18.3: Solar and Wind Energy, 561-569 18.4: Energy From Hydrogen, 570-573
Performance Expectations	
HS-ESS3-3: Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.	**SE/TE:** Causes of Biodiversity Loss, 209-211 Lesson 2 Assessment, #3, 211 Ecosystem and Habitat Approaches, 215-517 Chapter 7 Assessment, #20, #34, 222-223 Ecological Footprints, 223 Impacts of Population, 242-246 Investigative Phenomenon, 245 What Do You Think?, 246 Chapter 8 Assessment, #34, 253 Ecological Footprints, 253 Renewable Resource Management, 324-327 Investigative Phenomenon, 325 Management Approaches, 327-329 Dwindling Deposits, 527

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HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	**SE/TE:** Real Data, 332 Everyday Phenomenon, 502 Use and Production of Electricity, 502-503 Transportation, 504 Other Approaches to Reducing Greenhouse Gases, 505-506 Lesson 4 Assessment, #5, 507 Chapter 16 Assessment, #38, 512 Figure 5: A Geothermal Power Plant, 554 Figure 8: Hydropower Dam, 557 Figure 17: How a Wind Turbine Generates Electricity, 567 How Fuel Cells Are Used, 573
Disciplinary Core Ideas	
Human Impacts on Earth Systems	
• The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources.	**SE/TE:** Renewable Resource Management, 324-327 Investigative Phenomenon, 325 Management Approaches, 327-329 What Do You Think?, 328 Responsible Mineral Use, 411 Solutions That Reduce Demand, 433-434 Lesson 2 Assessment, #5, 434 Energy Conservation, 535
• Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation.	**SE/TE:** Vehicle Technology, 504 Air Pollution, 530 Benefits of Nuclear Power, 539 21st Century Skills, 543 Ground Source Heat Pumps, 554-555 Figure 8: Hydropower Dam, 557 Photovoltaic Cells, 562-563 Figure 13: Going Solar, 563 Concentrating Solar Power (CSP), 564 Figure 17: How a Wind Turbine Generates Electricity, 567 How Fuel Cells Are Used, 573

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Developing Possible Solutions	
• When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.	**SE/TE:** Management Approaches, 327-329 Lesson 1 Assessment, #2, 329 Benefits and Costs of Nuclear Power, 539-540 What Do You Think?, 553 Benefits and Costs of Geothermal Energy, 555 Benefits and Costs of Hydropower, 558-559 Benefits and Costs of Solar Power, 565-566 Benefits and Costs of Wind Power, 568-569 Benefits and Costs of Energy from Hydrogen, 572
Crosscutting Concepts	
Stability and Change	
• Change and rates of change can be quantified and modeled over very short or very long periods of time. Some system changes are irreversible.	**SE/TE:** Chapter 7 Assessment, #17, #18, #19, #20, 222 Chapter 8 Assessment, #33, #34, 253 Interpret Graphs, 327 Interpret Graphs, 527 Chapter 17 Assessment, #33, #34, #35, #36, 547
• Feedback (negative or positive) can stabilize or destabilize a system.	**SE/TE:** Feedback Loops, 73-74 Agriculture and Forestry, 505
Science and Engineering Practices	
Using Mathematics and Computational Thinking	
• Create a computational model or simulation of a phenomenon, designed device, process, or system.	**SE/TE:** Ecological Footprints, 223 Figure 5: A Geothermal Power Plant, 554 Figure 6: Ground Source Heat Pump, 555 Figure 8: Hydropower Dam, 557 Figure 13: Going Solar, 563 Figure 17: How a Wind Turbine Generates Electricity, 567 Figure 24: A Fuel Cell, 572
Constructing Explanations and Designing Solutions	
• Design or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.	**SE/TE:** Chapter 7 Assessment, #32, 223 Real Data, 332 Lesson 4 Assessment, #5, 507 Chapter 16 Assessment, #38, 513 What Do You Think?, 553

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UNIT 9: Global Climate Change	
Essential Questions	
How do people model and predict the effects of human activities on Earth's climate?	**SE/TE:** 16.2: Climate Change, 491-496 16.3: Effects of Climate Change, 497-501
What regulates weather and climate?	**SE/TE:** 15.1: Earth's Atmosphere, 452-460 16.1: Our Dynamic Climate, 484-490
How do Earth's major systems interact?	**SE/TE:** 16.1: Our Dynamic Climate, 484-490 16.3: Effects of Climate Change, 497-501
Performance Expectations	
HS-ESS2-4: Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	**SE/TE:** The Troposphere and Weather, 458 Everyday Phenomenon, 484 Energy From the Sun, 484-487 Investigative Phenomenon, 485 Quick Lab: Does Latitude Affect the Sun's Rays?, 486 Wind Patterns in the Atmosphere, 487 The Oceans and Climate, 488-489 Real Data, 493 Models: Predicting the Future, 494-495 Finding the Cause of Climate Change, 495-496 Lesson 2 Assessment, #3, #4, 496 Chapter 16 Assessment, #20, #26, #40, 512-513
HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.	**SE/TE:** Rising Temperatures, 491 Studying Climate Change, 493-495 Real Data, 493 Figure 9: Climate Model, 495 Figure 10: Greenhouse Gases, 496 Lesson 2 Assessment, #2, 496 The Future of Ecosystems, 499 Future Impact on People, 501 Chapter 16 Assessment, #21, #30, 40, 512-513
HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.	**SE/TE:** Figure 1: Greenhouse Effect, 485 Wind Patterns in the Atmosphere, 487 The Oceans and Climate, 488-489 Evidence of a Warming Earth, 491-492 Figure 9: Climate Model, 495 Finding the Cause of Climate Change, 495-496 Lesson 2 Assessment, #3, #4, 496 Chapter 16 Assessment, #20, #26, #40, 513

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Disciplinary Core Ideas	
Weather and Climate	
• The foundation for Earth's global climate systems is the electromagnetic radiation from the sun, as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems, and this energy's re-radiation into space.	**SE/TE:** Everyday Phenomenon, 484 Energy from the Sun, 484-487 Wind Patterns in the Atmosphere, 487 Ocean Circulation, 488 Ocean Absorption of Carbon Dioxide, 489 Chapter 16 Assessment, #29, 512
• Current models predict that average global temperatures will continue to rise. The outcomes predicted by global climate models strongly depend on the amounts of human-generated greenhouse gases added to the atmosphere each year and by the ways in which these gases are absorbed by the ocean and biosphere.	**SE/TE:** Ocean Absorption of Carbon Dioxide, 489 Regional Vegetation, 490 Rising Temperatures, 491 Models: Predicting the Future, 494-495 Finding the Cause of Climate Change, 495-496 Lesson 2 Assessment, #2, 496
Global Climate Change	
• Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts.	**SE/TE:** Studying Climate Change, 493-495 Real Data, 493 Future Impact on People, 501 Use and Production of Electricity, 502-503 Driving Less and Using Public Transportation, 504 Other Approaches to Reducing Greenhouse Gases, 505-506
• Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities.	For supporting content, please see: **SE/TE:** Studying Climate Change, 493-495 Lesson 2 Assessment, #2, 496 Science Behind the Stories: Climate Clues in Ice, 508-509
Earth Materials and Systems	
• The geological record shows that changes to global and regional climate can be caused by interactions among changes in the sun's energy output or Earth's orbit, tectonic events, ocean circulation, volcanic activity, glaciers, vegetation, and human activities. These changes can occur on a variety of time scales from sudden to intermediate to very long-term.	**SE/TE:** Everyday Phenomenon, 484 Energy From the Sun, 484-487 The Oceans and Climate, 488-489 Other Factors That Affect Climate, 489-490 Finding the Cause of Climate Change, 495-496 Lesson 2 Assessment, #3, #4, 496 Chapter 16 Assessment, #20, #26, 512
Earth and the Solar System	
• Cyclical changes in the shape of Earth's orbit around the sun, together with changes in the tilt of the planet's axis of rotation, both occurring over hundreds of thousands of years, have altered the intensity and distribution of sunlight falling on the earth. These phenomena cause a cycle of ice ages and other gradual climate changes.	**SE/TE:** Changes in Earth's Orbit, 490

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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:** Everyday Phenomenon, 484 Lesson 1 Assessment, #1, 490 Investigative Phenomenon, 495 Lesson 2 Assessment, #3, #4, 496 Lesson 3 Assessment, #1, 501 Chapter 16 Assessment, #25, #26, #40, 512-513
Stability and Change	
• Change and rates of change can be quantified and modeled over very short or very long periods of time. Some system changes are irreversible.	**SE/TE:** Rising Temperatures, 491 Figure 7: A Disappearing Glacier, 492 Real Data, 493 Figure 10: Greenhouse Gases, 496 Science Behind the Stories: Climate Clues in Ice, 508-509
Systems and System Models	
• When investigating or describing a system, the boundaries and initial conditions of the system need to be defined and their inputs and outputs analyzed and described using models.	**SE/TE:** Figure 1: Greenhouse Effect, 485 Quick Lab: Does Latitude Affect the Sun's Rays?, 486 Figure 4: El Niño, 488 Figure 9: Climate Model, 495 Lesson 2 Assessment, #2, 496
Science and Engineering Practices	
Developing and Using Models	
• Use a model to provide mechanistic accounts of phenomena.	**SE/TE:** Quick Lab: Does Latitude Affect the Sun's Rays?, 486 Figure 9: Climate Model, 495 Chapter 16 Assessment, #40, 513
Analyzing and Interpreting Data	
• Analyze data using computational models in order to make valid and reliable scientific claims.	**SE/TE:** Real Data, 493 Figure 9: Climate Model, 495
Using Mathematics and Computational Thinking	
• Use a computational representation of phenomena or design solutions to describe and/or support claims and/or explanations.	**SE/TE:** Figure 9: Climate Model, 495