

A Correlation of

Environmental Science
Your World, Your Turn ©2021



To the
Minnesota
2019 Academic Standards in Science
Earth & Space Science

**A Correlation of Environmental Science: Your World, Your Turn ©2021
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Introduction

This document demonstrates how *Environmental Science: Your World, Your Turn* ©2021 supports the Minnesota 2019 Academic Standards for Earth and Space 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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(1.0) Exploring phenomena or engineering problems	
(1.1) Asking questions and defining problems	
9E.1.1.1.1 Ask questions to clarify how seismic energy traveling through Earth's interior can provide evidence for Earth's internal structure. (P: 1, CC: 6, Cl: ESS2)	SE/TE: Earth's Spheres, 74-75 Figure 14: Earth's Spheres, 75 Earth's Crust and Mantle, 76 The Core, 76 Figure 2: Earth's Layers, 393
(1.2) Planning and carrying out investigations	
9E.1.2.1.1 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. (P: 3, CC: 6, Cl: ESS2)	SE/TE: Bonding, 65 Properties of Water, 69-71 Lesson 1 Assessment, #3, 71 Physical Weathering, 354 Chemical Weathering, 354 Sedimentary Rock, 396 Quick Lab: How Does the Hot Water Move?, 459 The Oceans and Climate, 488-489
9E.1.2.1.2 Plan and conduct an investigation of the properties of soils to model the effects of human activity on soil resources. (P: 3, CC: 2, Cl: ESS3, ETS2)	SE/TE: Soil Horizons, 355 Go Outside: Classifying Soil, 356 Soil Characteristics, 356-357 Lesson 1 Assessment, #3, 357 Everyday Phenomenon, 358 Erosion, 358-361 Figure 8: Overgrazing, 360 Desertification, 361 Soil Conservation Policies, 362-363 Salinization Causes, 363 Lesson 2 Assessment, #1, #2, 364
(2.0) Looking at data and empirical evidence to understand phenomena or solve problems	
(2.1) Analyzing and interpreting data	
9E.2.1.1.1 Analyze data to make a valid scientific claim about the way stars, over their life cycle, produce elements. (P: 4, CC: 5, Cl: ESS1)	For supporting content, please see: SE/TE: Atoms and Elements, 64-65

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9E.2.1.1.2 Analyze geoscience data to make a claim that one change to the Earth's surface can create feedbacks that cause changes to other Earth systems. (P: 4, CC: 7, CI: ESS2, ETS2)	SE/TE: Feedback Loops, 73-74 Lesson 2 Assessment, #3, 75 Human Impacts, 82 Effects of Overgrazing, 360 Figure 8: Overgrazing, 360 Everyday Phenomenon, 484 Energy from the Sun, 484-487 Wind Patterns in the Atmosphere, 487 Ocean Circulation, 488 Ocean Absorption of Carbon Dioxide, 489 Changes in Use of Land, 496 Chapter 16 Assessment, #26, #29, 512
9E.2.1.1.3 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's systems and human infrastructure.* (P: 4, CC: 7, ESS3, ETS1)	SE/TE: Evidence of a Warming Earth, 491-492 Direct Measurement of Present Conditions, 493 Real Data, 493 Models: Predicting the Future, 494-495 Figure 10: Greenhouse Gases, 496 Lesson 2 Assessment, #2, 496 Everyday Phenomenon, 497 The Future of Ecosystems, 499 Investigative Phenomenon, 500 Future Impact on People, 501 Lesson 3 Assessment, #3, #4, 501 Chapter 16 Assessment, #40, 513
(2.2) Using mathematics and computational thinking	
9E.2.2.1.1 Use mathematical and computational representations to predict the motion of natural and human-made objects that are in orbit in the solar system.** (P: 5, CC: 3, CI: ESS1, ETS2)	Space sciences are beyond the scope of <i>Environmental Science: Your World Your Tum</i> .
9E.2.2.1.2 Develop a computational model, based on observational data, experimental evidence, and chemical theory, to describe the cycling of carbon among Earth's systems.** (P: 2, CC: 5, CI: ESS2)	For supporting content, please see: SE/TE: The Carbon Cycle, 83-85 Figure 21: Carbon Cycle, 84 Lesson 4 Assessment, #1, 89

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9E.2.2.1.3 Develop or use an algorithmic representation, based on investigations of causes and effects in complex Earth systems, to illustrate the relationships within some part of the Earth system and how human activity might affect those relationships. (P: 5, CC: 4, CI: ESS3, ETS2)	For supporting content, please see: SE/TE: Human Impacts, 82 Human Impacts, 86 Lesson 4 Assessment, #5, 89 Chapter 3 Assessment, #36, 95 Everyday Phenomenon, 358 Erosion, 358 Effects of Overgrazing, 360 Reading Checkpoint, 360 Desertification, 361 Reading Checkpoint, 361 Lesson 2 Assessment, #2, 364 Finding the Cause of Climate Change, 495-496 Lesson 2 Assessment, #3, #4, 496 Chapter 16 Assessment, #20, #40, 513
(3.0) Developing possible explanations of phenomena or designing solutions to engineering problems	
(3.1) Developing and using models	
9E.3.1.1.1 Develop and use a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation. (P: 2, CC: 3, CI: ESS1)	SE/TE: Energy From the Sun, 484 Sunspot Cycles, 487 Changes in Earth's Orbit, 490 Nuclear Fusion: The Future?, 541
9E.3.1.1.2 Develop and use a model based on evidence to explain how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. (P: 2, CC: 7, CI: ESS2)	SE/TE: Plate Tectonics, 77 Types of Plate Boundaries, 78 Figure 16: Plate Boundaries, 78 Figure 6: The Rock Cycle, 397
9E.3.1.1.3 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. (P: 2, CC: 4, CI: ESS2)	SE/TE: Everyday Phenomenon, 484 The Greenhouse Effect in the Atmosphere, 484-485 The Effect of Latitude, 485-486 Figure 2: Climate Zones, 486 Quick Lab: Does Latitude Affect the Sun's Rays?, 486 Wind Patterns in the Atmosphere, 487 Ocean Circulation, 488 Lesson 1 Assessment, #1, 490 Chapter 16 Assessment, #25, 512

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9E.3.1.1.4 Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. (P: 2, CC: 2, Cl: ESS2).	SE/TE: Everyday Phenomenon, 484 Energy From the Sun, 484-487 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
(3.2) Constructing explanations and designing solutions	
9E.3.2.1.1 Construct an explanation that links astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe to the Big Bang. (P: 6, CC: 5, Cl: ESS1, ETS2)	Space sciences are beyond the scope of <i>Environmental Science: Your World Your Tum</i> .
9E.3.2.1.2 Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history. (P: 6, CC: 7, Cl: ESS1)	For supporting content, please see: SE/TE: Earth's Crust and Mantle, 76 Plate Tectonics, 77 Chapter 3 Assessment, #28, 94 Figure 2: Earth's Layers, 393 Figure 6: The Rock Cycle, 397
9E.3.2.2.1 Evaluate or refine a technological solution to reduce the human impacts on a natural system and base the evaluations or refinements on evidence and analysis of pertinent data.* (P: 6, CC: 7, Cl: ESS3, ETS1, ETS2)	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 8: Hydropower Dam, 557 Figure 17: How a Wind Turbine Generates Electricity, 567 Figure 24: A Fuel Cell, 572 How Fuel Cells Are Used, 573 Everyday Phenomenon, 589 Quick Lab: Reduce, Reuse, Recycle, 591

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(4.0) Communicating reasons, arguments and ideas to others	
(4.1) Arguing from evidence	
9E.4.1.1.1 Evaluate the evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. (P: 7, CC: 1, Cl: ESS1)	SE/TE: Plate Tectonics, 77 Map It: Pangaea, 77 Types of Plate Boundaries, 78
9E.4.1.1.2 Evaluate the evidence and reasoning for the explanatory model that Earth's interior is layered and that thermal convection drives the cycling of matter. (P: 7, CC: 5, Cl: ESS2)	SE/TE: Earth's Crust and Mantle, 76 The Core, 76 Plate Tectonics, 77 Lesson 3 Assessment, #1, 82 Chapter 3 Assessment, #28, 94 Rocks, 395
9E.4.1.1.3 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.* (P: 7, CC: 5, Cl: ESS3, ETS1)	SE/TE: Mining Methods, 399-402 Investigative Phenomenon, 400 Responsible Mineral Use, 411 Lesson 3 Assessment, #4, 411 Chapter 13 Assessment, #35, 417 Figure 9: Extracting Oil, 526 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 A Closer Look: 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 Point Counterpoint: Are Biofuels Better For the Environment?, 574-575 Chapter 18 Assessment, #37, 579

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(4.2) Obtaining, evaluating and communicating information	
9E.4.2.1.1 Compare, integrate and evaluate sources of information in order to determine how specific factors, including human activity, impact the groundwater system of a region. (P: 8, CC: 2, CI: ESS2, ETS2)	SE/TE: Human Impacts, 82 Chapter 3 Assessment, #34, 95 Disadvantages, 379 Water Pollution, 406 Aquifers, 424-425 Using Groundwater, 430-432 Lesson 2 Assessment, #3, 434 Sources of Groundwater Pollution, 439 Chapter 14 Assessment, #29, 448 Strip Mining and the Environment, 532
9E.4.2.2.1 Apply place-based evidence, including those from Minnesota American Indian Tribes and communities and other cultures, to construct an explanation of how a warming climate impacts the hydrosphere, geosphere, biosphere, or atmosphere. (P: 8, CC: 4, CI: ESS3)	SE/TE: Science Behind the Stories: The Cloudless Forest, 118-119 Climate Change, 211 Real Data, 493 Everyday Phenomenon, 497 Effects on Ecosystems and Organisms, 497-499 Reading Checkpoint, 498 Agriculture and Forestry, 500 Sea Level, 501 Lesson 3 Assessment, #1, 501 Chapter 16 Assessment, #21, #30, #40, 512-513

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