

# Unit 1: Introduction to Environmental Science

Content Area: **Science**  
Course(s): **Environmental Science**  
Time Period: **1st Marking Period**  
Length: **3 Weeks**  
Status: **Published**

## Unit Overview

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Environmental Science is a multidisciplinary science that draws from all sciences, as well as other fields, to help us better understand the relationship between humans and the world in which we live through use of scientific methods allows for the identification of major environmental issues.

## Transfer

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Students will be able to independently use their learning to...

-What kinds of long term, independent accomplishments are desired?

- Become environmentally aware and accurately distinguish between renewable and nonrenewable resources.
- Identify connections between different fields of study and how they apply to environmental science.
- Identify major environmental problems.
- Explain sustainability and identify the reasons that it is a major goal of environmental science.
- Investigate science in a way that utilizes a good hypothesis and describe how scientists study subjects in which experiments are only theoretical.

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For more information, read the following article by Grant Wiggins.

[http://www.authenticeducation.org/ae\\_bigideas/article.lasso?artid=60](http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60)

## Meaning

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## **Understandings**

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Students will:

- Identify the relationship between environmental changes and effects based on major changes in social and economic strategies.
- Develop an interest in the dynamics that differentiate a developing country from a developed country.
- Compose a hypothesis that can be supported with experimentation and respect the evidence allowing for an informed decision.
- Recognize the importance of repeating experiments to get valid test results.

## **Essential Questions**

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Students will keep considering...

What is an environmental change?

How do humans affect the environment?

What can humans do to reverse or improve the environment?

## **Application of Knowledge and Skill**

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### **Students will know...**

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Students will know...

What facts and basic concepts should students know and be able to recall?

Environmental Science is a multidisciplinary field.

Distinguish between renewable and non renewable resources.

Identify environmental problems.

Changes throughout history correspond to changes in the environment.

Identify differences between developed and developing countries.

Explain why sustainability is a goal of environmental science.

### **Students will be skilled at...**

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Students will be skilled at...

What discrete skills and processes should students be able to use?

How to write an effective hypothesis.

Identify the parts of a good experiment.

Identifying how new concepts in developed worlds cause problems with human sustainability.

### **Academic Vocabulary**

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Environmental Science

Observation

Value

Ecology

Hypothesis

Decision making model

Agriculture

Prediction

Statistics

Natural Resource

Experiment

Mean

Pollution

Variable

Distribution

Biodiversity  
Experimental group  
Probability  
Law of supply and demand  
Control group  
Sample  
Ecological Footprint  
Sustainability  
Data  
Risk  
Correlation  
Model  
Conceptual model  
Mathematical model

### **Target 1**

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SWBAT: Describe how environmental change has occurred throughout history and the problems we face today are a direct result of both the agricultural and industrial revolutions.

### **Target 2**

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SWBAT: Identify Environmental Science as an interdisciplinary study of human interactions in their environment drawing information from all disciplines. One important foundation of environmental science is the science of ecology.

### **Learning Goal 2**

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Science is a process by which we learn about the world around us. Science progresses mainly by the experimental method.

SCI.HS-ESS2-7	Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.
SCI.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.
9-12.HS-ESS3-5.4.1	Analyze data using computational models in order to make valid and reliable scientific claims.
9-12.HS-ESS3-3.5.1	Create a computational model or simulation of a phenomenon, designed device, process, or system.

### **Target 1**

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SWBAT: Investigate why the experimental method involves making observations, forming a hypothesis, performing an experiment, interpreting data, and communication results.

### **Target 2**

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SWBAT: Use models, including conceptual and mathematical models, to understand the systems they study.

### **Learning Goal 3**

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Making environmental decisions involves gathering information, considering values, and exploring consequences.

SCI.HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
SCI.HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

### **Target 1**

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SWBAT: Compare and Contrast decisions about the environment and how they should be made thoughtfully. Using a decision-making model will provide you with a systematic process for making knowledgeable decisions.

### **Formative Assessment and Performance Opportunities**

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- Class discussions
  - Paper and pencil tests

- Science notebook
- Student displays and presentations
- Student experimnts
- Student worksheets

## **Summative Assessment**

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All assessments are differentiated and aligned to the science to the science standards and curriculum.

Alternate assessments may include projects or presentations, or a common paper/pencil assessment or both. Common Assessment is administered through LinkIt.

## **Accommodations/Modifications**

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- Modify student notebook contents to include additional study materials specific to experimental inquiry
- Provide access to Albert.io online resource specific to Environmental impact
- Use formative assessments to organize student groups

## **Unit Resources**

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- Environmental Science, Holt, Reinhart & Winston, 2008
- Interactive white board activities where aproprate.
- Internet.
- Supplemental Textbooks/Articles and Teacher resources.
- Videos and Online Videos.

## **21st Century Life and Careers**

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WORK.9-12.9.1.12.1

The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time.

WORK.9-12.9.1.12.1

Gathering and evaluating knowledge and information from a variety of sources, including

	global perspectives, fosters creativity and innovative thinking.
WORK.9-12.9.1.12.1	Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency.
WORK.9-12.9.1.12.2	Critical thinking and problem solving in the 21st century are enhanced by the ability to work in cross-cultural teams in face-to-face and virtual environments.
WORK.9-12.9.1.12.A.1	Apply critical thinking and problem-solving strategies during structured learning experiences.
WORK.9-12.9.1.12.A.3	Assess how a variety of problem-solving strategies are being used to address solutions to global problems by participating in online discussions with peers from other countries.

## Interdisciplinary Connections

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MA.S-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
MA.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.
MA.N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
LA.RST.11-12.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
MA.S-IC.A.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
LA.RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
LA.RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
MA.S-IC.B.6	Evaluate reports based on data.
LA.RST.9-10.8	Determine if the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
LA.WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

