

Environmental Science

Environmental Science is an interdisciplinary course covering a wide variety of topics including biology, physics, geology, ecology, chemistry, geography, astronomy, meteorology, oceanography, and engineering. The course also considers ways in which human populations affect our planet and its processes. Of special emphasis is the concept of sustainability as a means of using resources in a way that ensures they will always be around us.

The unifying concepts that tie the different areas of environmental science together are as follows:

- Science provides a way to learn more about the world and influences how we understand it.
- Energy conversions underlie all ecological processes.
- The Earth is one interconnected system.
- Humans change natural systems.
- Environmental issues have a cultural and social context.
- Human existence depends in part on increasing practices that will achieve sustainability.

Students at this level should show development in their understanding of scientific inquiry. The course provides hands-on labs and research to aid in arriving at a deeper understanding of the environment and the impact of humans on it today and in the past. The labs will call upon students to analyze many different processes and systems, arrive at conclusions, and determine ways in which every person can positively influence the environment.

Upon completion of the course, students should be able to:

- Define environmental science and describe the field of environmental science studies;
- Identify the other fields of study that contribute to environmental science;
- Identify ways in which humans depend on the environment;
- Give examples of renewable and nonrenewable resources and distinguish between them;
- List the five general causes of environmental degradation;
- Explain what is meant by sustainability;
- Define energy;
- Describe different forms of energy, and give examples of each;
- Understand energy transformation, energy efficiency, and the law of conservation of energy.

Unit 1: Environmental Science Semester One	
Assignments	
1. Course Overview	37. Population Ecology
2. Introduction to Environmental Science	38. Community Ecology
3. Lab: Introduction to Lab Safety	39. Ecological Succession
4. Earth's History	40. Threatened and Endangered Species
5. Plate Tectonics	41. Lab: Oil Spill Experiment
6. Earth's Atmosphere	42. Project: Threatened and Endangered Species
7. Lab: Air Pressure	43. Protecting Biodiversity
8. Weather and Climate	44. Project: Protecting Biodiversity
9. Atmospheric Circulation	45. Terrestrial Biomes
10. Lab: Atmospheric Circulation and Patterns	46. Project: Terrestrial Biomes
11. Earth's Water	47. Aquatic Life Zones
12. Project: Earth's Water	48. Lab: Descending into the Depths
13. Water Use	49. Freshwater Life Zones
14. Lab: Soapy Water	50. Lab: Freshwater Life Zones
15. Project: Water Use	51. Population Age Structure
16. Water Conservation	52. Project: Population Age Structure
17. Lab: Water Conservation	53. Effects of a Growing Human Population
18. Rock Cycle	54. Project: Effects of a Growing Human Population
19. Lab: Rocks Rock!	55. Food Resources
20. Project: Rock Cycle	56. Lab: Food Resources
21. Soil	57. Pest Management
22. Lab: Digging for Soil	58. Project: Pest Management
23. Soil Conservation	59. Forestry
24. Lab: Erosion Virtual Experiment	60. Project: Forestry
25. Project: Soil Conservation	61. Rangelands
26. Ecology	62. Project: Rangelands
27. Project: Ecology	63. Land Conservation
28. Evolution and Biodiversity	64. Project: Land Conservation
29. Lab: Species Diversity	65. Mining
30. Project: Evolution and Biodiversity	66. Project: Mining
31. Energy Flow in Ecosystems	67. Fisheries
32. Lab: Local Food Webs	68. Special Project*
33. Project: Energy Flow in Ecosystems	69. Review
34. Nutrient Cycles	70. Midterm Exam
35. Water Cycle	71. Glossary and Credits
36. Lab: Building a Model Watershed	

Unit 2: Environmental Science Semester Two	
Assignments	
Environmental Science	1. Introduction to Energy
	2. Energy Consumption History
	3. Fossil Fuels
	4. Project: Fossil Fuels
	5. Lab: The Effects of an Oil Spill
	6. Coal
	7. Project: Coal
	8. Synthetic Fuels
	9. Lab: Energy of an Alternate Fuel Source
	10. Introduction to Nuclear Energy
	11. Project: Introduction to Nuclear Energy
	12. Nuclear Power Plants
	13. Lab: Nuclear Chain Reaction
	14. Project: Nuclear Power Plants
	15. Nuclear Energy and the Environment
	16. Project: Nuclear Energy and the Environment
	17. Hydroelectric Power
	18. Project: Hydroelectric Power
	19. Tides and Waves
	20. Project: Tides and Waves
	21. Lab: What Can a Wave Do?
	22. Solar Energy
	23. Lab: Solar Energy
	24. Wind Power
	25. Project: Wind Power
	26. Geothermal Power
	27. Project: Geothermal Power
	28. Hydrogen Fuel
	29. Project: Hydrogen Fuel
	30. Energy Efficiency
	31. Lab: Energy Use and Your Family
	32. Project: Energy Efficiency
	33. Introduction to Air Pollution
34. Project: Introduction to Air Pollution	
35. Lab: Temperature Inversion	
36. Acid Deposition	
37. Lab: Acid Rain, Part One - Analysis	
38. Lab: Acid Rain, Part Two - Hands-on	
39. Project: Acid Deposition	
40. Climate Change	
41. Lab: Greenhouse Gasses and Climate Change	
42. Project: Climate Change	
43. Reducing Air Pollution	
44. Lab: How Green Is Your Car?	
45. Project: Reducing Air Pollution	
46. Noise Pollution	
47. Project: Noise Pollution	
48. Water Pollution	
49. Lab: Solubility	
50. Sewage Treatment	
51. Solid Waste	
52. Project: Solid Waste	
53. Lab: Solid Waste	
54. Hazardous Waste	
55. Project: Hazardous Waste	
56. Environmental Health	
57. Project: Environmental Health	
58. Sustainable Cities	
59. Project: Sustainable Cities	
60. Environmental Economics	
61. Project: Environmental Economics	
62. Lab: An Environmental Science Field Trip	
63. Special Project*	
64. Review	
65. Final Exam	
66. Glossary and Credits	