
Outline Syllabus for Environmental Science

UNIT 1 ENVIRONMENTAL SCIENCE OVERVIEW

Class Guidelines
Introduction
Nature Walk
The Wealth Gap
The Wealth Gap
Pollution Overview
History of the Conservation Movement

UNIT 2 BIOMES

Effect of Climate
Photoperiod Analysis
Photoperiod Analysis, continued
Desert and Mountain Biomes
Biome Climate
Grassland Biome and Policy
Biome Climatographs, continued
Forest Biomes
Forestry Management
Dendrology, continued and measuring a tree
Deforestation
Marine and Freshwater Biomes

UNIT 3 ECOSYSTEM STRUCTURE

Conducting Research
Habitat Census - Estimating populations
Ecosystem Terms
Habitat Census Step 2: Field work collecting population census
Ecosystem Principles
Nature Walk - Conducting Field Research
Trophic Relationships
Mammalian Adaptations
Hibernation and Migration
Barn Owl Food

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UNIT 4 ECOSYSTEM STRATEGIES

Specialist and Generalist Species
Birds as Indicator Species – Part 1 Building a Nest Box
Keystone Species
Alligators as Keystone Species
Species Interactions
Feeder box census and film on birds
Backyard Birds
Part 3 - Coloring Birds for Identification
Part 4 - Listening to learn bird songs and calls
Succession
Nature Walk

UNIT 5 ANIMAL POPULATION DYNAMICS

Population Dynamics
Endangered Species
Natural Selection
Amphibians
Natural Selection in Frogs
Fatal Subtraction
Endangered Species
Manatees
Rate of Population Change
Wildlife Management

UNIT 6 HUMAN POPULATION DEMOGRAPHICS

Demography
Population Videos
Human Dynamics
Population Demographics
Toxicology
Lethal Dose Bioassay
Risk Analysis
Bacterial Risks Analysis
Urban Adaptations
Bacterial Risks Analysis

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UNIT 7 SOCIAL INFLUENCES

Ethics and Choices

Land Ethic

Economic Influences

Environmental Project

Political Influences

Activism

Environmental Leadership

UNIT 8 ENERGY RESOURCES

Energy Terms

Laws of Energy

Solar Box Cooker – building the cooker

Nonrenewable Energy Resources

Renewable Energy Resources

Energy Audit and Calculations – audit part 2

UNIT 9 THE LAND ENVIRONMENT

Structure of the Earth

Nature Walk - build a compost pile and collect soil samples

Soil

Trash Analysis and Composting

Minerals and Mining

Soil Biodiversity Indexes

Solid Wastes

Soil Biodiversity Indexes

Hazardous Wastes

Soil Quality Testing

Public Land Use Policy

Soil Quality Testing

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UNIT 10 AGRICULTURE RESOURCES

Food Production
Earth's Carrying Capacity
Agricultural Practices and Policy
Plants That Changed History
Hydroponics Growing
Pest Control
Flower Photo Shoot
Insects
Insect Collection
Nature Walk

UNIT 11 THE AIR ENVIRONMENT

Atmospheric Structure
Meteorology Survey – begin daily survey
Air Pollution
Meteorology Survey
Greenhouse Effect
Air Quality Measurements
Global Temperature Change
UV beads
Air Policy and Regulation
Guest Speaker - Meteorologist

UNIT 12 THE WATER ENVIRONMENT

Hydrologic Cycle
The Magic Molecule
Flooding
Stream Flow Volume
Groundwater
Stream Flow Volume
Water Pollution
Water Quality Analysis – chemical and physical survey
Water Resources
Water Quality Analysis – biological survey
Water Policy and Regulation
Freshwater Fish

Detailed Syllabus for Environmental Science

UNIT 1 ENVIRONMENTAL SCIENCE OVERVIEW

Day

- 1 Class Guidelines
- 2 Lecture 1.1 Introduction
- 3 Film on Aldo Leopold's "Sand County Almanac" (SCA)
- 4 Quiz on the featured month from Sand County Almanac and Journal Writing
- 5 Lab #1 Nature Walk
- 6 Lecture 1.2 The Wealth Gap
- 7 Lab #2 The Wealth Gap
- 8 Lecture 1.3 Pollution Overview
- 9 Lab #1 Nature Walk Journal - questions
- 10 Lecture 1.4 History of the Conservation Movement
- 11 Review for the test, return labs and go over answers, ask questions
- 12 TEST UNIT 1

UNIT 2 BIOMES

Day

- 1 Lecture 2.5 Effect of Climate
- 2 Lab #3 Photoperiod Analysis
- 3 Lab #3 Photoperiod Analysis, continued
- 4 Lecture 2.6 Desert and Mountain Biomes
- 5 Lab #4 Biome Climatographs
- 6 Lecture 2.7 Grassland Biome and Policy
- 7 Lab #4 Biome Climatographs, continued
- 8 Lecture 2.8 Forest Biomes
- 9 Nature Walk begin Lab #5 Dendrology by collection leaves
- 10 Lecture 2.9 Forestry Management
- 11 Lab #5 Dendrology, continued and measuring a tree
- 12 Lecture 2.10 Deforestation
- 13 Lab #5 Dendrology finish up, review for the test
- 14 Lecture 2.11 Marine and Freshwater Biomes
- 15 TEST UNIT 2

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UNIT 3 ECOSYSTEM STRUCTURE

Day

- 1 Lecture 3.12 Conducting Research
- 2 Lab #6 Habitat Census Step 1 Estimating populations
- 3 Lecture 3.13 Ecosystem Terms
- 4 Lab #6 Habitat Census Step 2: field work collecting population census
- 5 Lecture 3.14 Ecosystem Principles
- 6 Nature Walk - Begin Lab #8 Conducting Field Research
- 7 Lecture 3.15 Trophic Relationships
- 8 Lecture 3.16 Mammals
- 9 Lab #9 Mammalian Adaptations
- 10 Lecture 3.17 Hibernation and Migration
Place owl pellets in small beakers of water to soak overnight
- 11 Lab #7 Barn Owl Food Web - Part 1
- 12 Lab #7 Barn Owl Food Web - Part 2
Construct a rodent skeleton and finish the calculations
- 13 Review for the Test; Students should submit an initial written field study plan
- 14 TEST UNIT 3

UNIT 4 ECOSYSTEM STRATEGIES

Day

- 1 Lecture 4.18 Specialist and Generalist Species
- 2 Lab #11 Birds as Indicator Species – Part 1 Building a Nest Box
- 3 Lecture 4.19 Keystone Species
- 4 Lab #10 Alligators as Keystone Species
- 5 Lecture 4.20 Species Interactions
- 6 Lab #11 Part 2 - Feeder box census and film on birds
- 7 Lecture 4.21 Backyard Birds
- 8 Lab #11 Part 3 - Coloring Birds for Identification
- 9 Lab #11 Part 4 - Listening to learn bird songs and calls
- 10 Lecture 4.22 Succession
- 11 Quiz on Bird Songs and Review.
- 12 Nature Walk
- 13 TEST UNIT 4

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UNIT 5 ANIMAL POPULATION DYNAMICS

Day

- 1 Lecture 5.23 Population Dynamics
- 2 PowerPoint or Presentations Software: Lab #13 Endangered Species
- 3 Lecture 5.24 Natural Selection
- 4 Lecture 5.25 Amphibians
- 5 Lab #12 Natural Selection in Frogs
- 6 Lecture 5.26 Fatal Subtraction
- 7 Lab #13 – computer research and designing the presentations
- 8 Lecture 5.27 Endangered Species
- 9 Oral Reports from Lab #13
- 10 Lecture 5.28 Manatees
- 11 Lab #14 Rate of Population Change
- 12 Oral Reports from Lab #13
- 13 Lecture 5.29 Wildlife Management
- 14 Finish Oral Reports and Review for test
- 15 TEST UNIT 6

UNIT 6 HUMAN POPULATION DEMOGRAPHICS

Day

- 1 Lecture 6.30 Demography
- 2 Population Videos
- 3 Lecture 6.31 Human Dynamics
- 4 Lab #15 Population Demographics
- 5 Lab #15 Population Demographics - continued
- 6 Lecture 6.32 Toxicology
- 7 Lab #16 Lethal Dose Bioassay
- 8 Lecture 6.33 Risk Analysis
- 9 Lab #17 Bacterial Risks Analysis
Read plates from Lab #16 and answer questions for homework
- 10 Lecture 6.34 Urban Adaptations
- 11 Lab #17 Bacterial Risks Analysis
- 12 Review for the Test
- 13 TEST UNIT 6

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UNIT 7 SOCIAL INFLUENCES

Day

- 1 Lecture 7.35 Ethics and Choices
HW: Read the essay entitled the "Land Ethic" in the back of Sand County Almanac
- 2 Read and Discuss the Land Ethic by Leopold
- 3 Lecture 7.36 Economic Influences
- 4 Lab #18 Environmental Project
- 5 Lecture 7.37 Political Influences
- 6 Outdoor Activity - Students should work on their environmental projects
from Lab #18
- 7 Lecture 7.38 Activism
- 8 Students should work on their environmental projects from Lab #18
- 9 Lecture 7.39 Environmental Leadership
- 10 Review for the Test
Monitoring – part of the class period may be used for collecting data samples,
writing in journals or working on an environmental project
- 11 TEST UNIT 7

UNIT 8 ENERGY RESOURCES

Day

- 1 Lecture 8.40 Energy Terms
- 2 Nature Walk - Look for sources of energy for humans and wildlife
- 3 Lecture 8.41 Laws of Energy
- 4 Lab #19 Solar Box Cooker – building the cooker
- 5 Lecture 8.42 Nonrenewable Energy Resources
- 6 Lab #19 Cooking in the Solar Box Cooker and the conclusion questions
- 7 Lecture 8.43 Renewable Energy Resources
- 8 Lab #20 Energy Audit and Calculations – audit part 2
- 9 Lab #20 Energy Audit and Calculations – calculations part 1
- 10 Review and Monitoring
- 11 TEST UNIT 8

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UNIT 9 THE LAND ENVIRONMENT

Day

- 1 Lecture 9.44 Structure of the Earth
- 2 Nature Walk - build a compost pile and collect soil samples for Lab #22
- 3 Lecture 9.45 Solid Wastes
- 4 Lab # 21 Trash Analysis and Composting
- 5 Lecture 9.46 Minerals and Mining
- 6 Lab #22 Soil Biodiversity Indexes
- 7 Lecture 9.47 Soil
- 8 Lab #22 Soil Biodiversity Indexes
- 9 Lecture 9.48 Hazardous Wastes
- 10 Lab #23 Soil Quality Testing
- 11 Lecture 9.49 Public Land Use Policy
- 12 Lab #23 Soil Quality Testing
- 13 Review for the Test
Plant lettuce seeds in Styrofoam cups for Lab #25 in the next unit
- 14 TEST UNIT 9

UNIT 10 AGRICULTURE RESOURCES

Day

- 1 Lecture 10.50 Food Production
- 2 Lab #24 Earth's Carrying Capacity
- 3 Lecture 10.51 Agricultural Practices and Policy
- 4 Lecture 10.52 Plants That Changed History
- 5 Lab #25 Hydroponics Growing
- 6 Lecture 10.53 Pest Control
- 7 Lab #27 Flower Photo Shoot
- 8 Lecture 10.54 Insects
- 9 Lab #26 Insect Collection
- 10 Nature Walk
- 11 Review for the Test
- 12 TEST UNIT 10

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UNIT 11 THE AIR ENVIRONMENT

Day

- 1 Lecture 11.55 Atmospheric Structure
- 2 Lab #28 Meteorology Survey – begin daily survey
- 3 Lecture 11.56 Air Pollution
- 4 Lab #28 Meteorology Survey
- 5 Lecture 11.57 Greenhouse Effect
- 6 Lab #29 Air Quality Measurements - set out filter paper; Teacher Demonstration
- 7 Lecture 11.58 Global Temperature Change
- 8 Lab #29 Air Quality Measurements - observe and record data; UV beads
- 9 Lecture 11.59 Air Policy and Regulation
- 10 Guest Speaker - Meteorologist
- 11 Review for the Test
- 12 TEST UNIT 11

UNIT 12 THE WATER ENVIRONMENT

Day

- 1 Lecture 12.60 Hydrologic Cycle and Water Budget
- 2 Lab #30 The Magic Molecule
- 3 Lecture 12.61 Flooding Causes and Control
- 4 Lab #31 Stream Flow Volume – set leaf bags out for Lab #32
- 5 Lecture 12.62 Groundwater
- 6 Lab #31 Stream Flow Volume – finish collecting data or calculations
- 7 Lecture 12.63 Water Pollution
- 8 Lab #32 Water Quality Analysis – chemical and physical survey
- 9 Lecture 12.64 Water Usage and Resources
- 10 Lab #32 Water Quality Analysis – biological survey
- 11 Lecture 12.65 Water Policy and Regulation
- 12 Lab #33 Freshwater Fish – color fish pictures
- 13 Lecture 12.66 Freshwater Fish
- 14 Lab #33 Freshwater Fish – dissect fish
- 15 Review for the Test
- 16 TEST UNIT 12