This course focuses on ecology, which is the branch of biology that deals with interactions between organisms and their environments. This course covers ecosystems dynamics, as well as the basic principles of earth science. Students will also study the effects of human activities on ecosystems, including the release of pollution, solid waste management, resource management, and energy conservation. Emphasis is placed on how individuals can help to conserve Earth's environments for current and future generations.

This course is built to Virginia's standards for ecology.

Length: Two semesters

UNIT 1: INTRODUCTION TO ECOLOGY

LESSON 1: BIOLOGY AS SCIENCE

Study: The Nature of Science
Learn about what a scientist does, and what is and is not science.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: The Nature of Science
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: The Scientific Process
Learn about the scientific process and the scientific method.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: The Scientific Process
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Journal: What Is a Biologist
Reflect on what it means to be a biologist and what type of questions biologists answer.
Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 2: CONNECTIONS IN BIOLOGY

Study: Themes in Biology
Learn about the themes that connect all of biology.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Themes in Biology
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: Science, Society, and Technology
Learn about the connection between science and society.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Science, Society, and Technology
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Themes in Biology
Practice problem-solving skills related to concepts in the lesson.

Duration: 1 hr Scoring: 25 points

LESSON 3: DOING SCIENCE

Study: The Scientific Process
Learn about the process of scientific inquiry.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: The Scientific Process
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Scientific Method
Use the scientific method to perform a lab experiment
Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Scientific Method
Discuss the results of your lab.
Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: INTRODUCTION TO ECOLOGY WRAP-UP

Review: Unit Review
Prepare for the unit test by reviewing key concepts and skills.
Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Teacher-Scored Unit Test
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 1 hr Scoring: 50 points

UNIT 2: WHERE IS EARTH?

LESSON 1: OUR HOME

Study: The Layers of Earth Science
Learn about the fields that make up Earth science and about the scientists who work in them.
Duration: 1 hr

Study: A Global View
Differentiate among models used to graphically represent Earth. Examine maps and learn about how they are arranged.
Duration: 1 hr

Quiz: The Layers of Earth Science
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 21 points

LESSON 2: OUR NEIGHBORHOOD

Study: The Inner, Rocky Planets
Analyze similarities and differences among Mercury, Venus, Mars, and Earth.
Duration: 1 hr

Quiz: The Inner, Rocky Planets
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

Study: The Gas Giants and Pluto
Analyze similarities and differences among Jupiter, Saturn, Neptune, Uranus, and Pluto.
Duration: 1 hr

Quiz: The Gas Giants and Pluto
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

Journal: Choose a Planet
Create an article, real estate advertisement, or letter in order to share your thoughts about a planet you would like to visit.
Duration: 0 hrs 30 mins Scoring: 15 points

LESSON 3: PLANET EARTH

Study: The Moving Earth
Around and around we go. Discover how Earth's movements affect conditions on the planet.
Duration: 1 hr

Study: The Living Planet
Discover why life is able to survive on Earth.
Duration: 0 hrs 30 mins

Quiz: Planet Earth
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 18 points

Practice: Stopping the Revolution
Determine how well you understand Earth's movement in space.
Duration: 1 hr Scoring: 25 points

Discuss: Are We Alone?
Discuss the possible existence of aliens and whether you think space travel and planet colonization might be possible in the future.
Duration: 0 hrs 30 mins Scoring: 25 points

LESSON 4: WHERE IS EARTH? WRAP-UP

Review: Where Is Earth?
Prepare for the unit test by reviewing key concepts and skills.
Duration: 1 hr 30 mins

Test (CS): Where Is Earth?
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 27 points

Test (TS): Where Is Earth?
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 0 hrs 25 mins Scoring: 25 points

UNIT 3: THE ROCK WE LIVE ON

LESSON 1: MINERALS

Study: Mining for Minerals
Explore the structure and general characteristics of minerals.
Duration: 1 hr

Study: Identifying Minerals
Explore the unique chemical and physical properties of minerals. Discover tests that geologists use to identify minerals.
Duration: 0 hrs 30 mins

Quiz: Minerals
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

Journal: Mineral Research

Research a mineral and draw conclusions about mineral resources.

Duration: 0 hrs 30 mins Scoring: 15 points

LESSON 2: IGNEOUS AND SEDIMENTARY ROCKS

Study: Cool, Magma

Discover how igneous rocks form.

Duration: 1 hr

Study: Fire Up Your Skill

Get fired up about classifying igneous rocks.

Duration: 0 hrs 30 mins

Quiz: Cool, Magma

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 30 mins Scoring: 20 points

Study: From Particles to Rock

Describe the formation of clastic, biogenic, and chemical sedimentary rocks and discover some fossils.

Duration: 1 hr

Study: An Assortment of Sediments

Learn how to classify types of sedimentary rocks.

Duration: 0 hrs 30 mins

Quiz: From Particles to Rock

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 30 mins Scoring: 20 points

LESSON 3: METAMORPHIC ROCKS AND THE ROCK CYCLE

Study: Ch-Ch-Changes

Consider how heat and pressure can change the structure of a rock.

Duration: 1 hr

Study: Arranging Changes

Learn how to classify metamorphic rocks.

Duration: 0 hrs 30 mins

Quiz: Ch-Ch-Changes

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 30 mins Scoring: 20 points

Study: Rocky Road

Learn about the rock cycle and the forces that drive it.

Duration: 0 hrs 30 mins

Quiz: Rocky Road

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 30 mins Scoring: 20 points

Discuss: Rock the Rock Cycle

Discuss the rock cycle.

Duration: 0 hrs 30 mins Scoring: 25 points

Practice: Rock Steady

Practice what you have learned about the rock cycle.

Duration: 1 hr Scoring: 50 points

LESSON 4: THE ROCK WE LIVE ON WRAP-UP

Review: The Rock We Live On
Prepare for the unit test by reviewing key concepts and skills.
Duration: 1 hr 30 mins

Test (CS): The Rock We Live On
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 30 points

Test (TS): The Rock We Live On
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 0 hrs 45 mins Scoring: 70 points

UNIT 4: NUTRIENTS AND THEIR CYCLES

LESSON 1: LAND AND AIR

Study: Down and Dirty
Discover what happens when wind, water, and gravity do their dirty work.
Duration: 0 hrs 45 mins

Quiz: Down and Dirty
Test your understanding of weathering and erosion, karst topography, and glaciers.
Duration: 0 hrs 30 mins Scoring: 30 points

Study: Layers of the Atmosphere
Float through the atmosphere on layers upon layers of air as an amateur meteorologist.
Duration: 1 hr

Quiz: Layers of the Atmosphere
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

Discuss: What About This Ozone?
Discuss strategies for reducing our impact on the ozone layer.
Duration: 0 hrs 30 mins Scoring: 25 points

Practice: Up, Up, and Away
Create a diagram to help you remember the layers of the atmosphere.
Duration: 1 hr Scoring: 50 points

Lab: Investigating How Water Affects Earth's Rock
Complete a lab to investigate how water's ability to dissolve various minerals contributes to the weathering and erosion of rocks.
Duration: 1 hr 30 mins Scoring: 50 points

Lab: Investigate Weathering and Erosion
Complete a lab to build a model using graham crackers to show how continental features are formed by weathering and erosion.
Duration: 1 hr 30 mins Scoring: 50 points

LESSON 2: THE BUILDING BLOCKS OF LIFE

Study: Common Elements in Living Things
Learn about the structure of an atom, and the six main elements living things are made from.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Common Elements in Living Things
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Chemistry in Biology

Reflect on the role of chemistry in the study of biology

Duration: 0 hrs 40 mins Scoring: 20 points

Study: Water

Learn about the importance of water in living organisms, including the processes of hydrolysis, dehydration, and osmosis.

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Water

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: BIOGEOCHEMICAL CYCLES

Study: Water and Oxygen Cycles

Learn about the cycles of water and oxygen in the atmosphere and the importance of these to the preservation of life.

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Water and Oxygen Cycles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Carbon and Nitrogen Cycles

Learn about how carbon and nitrogen cycle through living things and the earth

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Carbon and Nitrogen Cycles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Investigate the Water Cycle

Complete a lab to investigate how living things are part of the water cycle in a terrarium you make as a model living system.

Duration: 1 hr 30 mins Scoring: 50 points

Lab: Investigate Cycling of O_2 and CO_2

Complete a lab to model the carbon cycle by observing how plants and yeast exchange gases with their surroundings.

Duration: 1 hr 30 mins Scoring: 50 points

LESSON 4: NUTRIENTS AND THEIR CYCLES WRAP-UP

Review: Nutrients and Their Cycles

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Nutrients and Their Cycles

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 34 points

Test (TS): Nutrients and Their Cycles

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 1 hr Scoring: 62 points

UNIT 5: SEMESTER 1 REVIEW AND EXAM

LESSON 1: SEMESTER 1 REVIEW AND EXAM

Review: Semester 1 Review

Prepare for the semester exam by reviewing key concepts covered in this semester.

Duration: 1 hr Scoring: 0 points

Exam: Semester 1 Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.
Duration: 0 hrs 30 mins Scoring: 60 points

Final Exam: Semester 1 Exam
Take a teacher-scored exam to demonstrate your mastery of concepts and skills covered in this semester.
Duration: 1 hr Scoring: 100 points

UNIT 6: ALL THE TIME IN THE WORLD

LESSON 1: MEASURING TIME

Study: Just in Time
Learn how scientists organize geologic time.
Duration: 0 hrs 45 mins

Study: Telling Time
Discover techniques that paleontologists use to date rocks and fossils.
Duration: 1 hr

Study: The Docile Fossil
Learn how to read the fossil record. Discover when it is and is not possible to read between the lines.
Duration: 1 hr

Quiz: Measuring Time
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

LESSON 2: THE PAST IS VAST

Study: Older Than Dirt
Catch a glimpse of what Earth looked like right after it formed and for the next few billion years or so the Precambrian era.
Duration: 1 hr

Study: Living History
Learn how the Paleozoic and Mesozoic eras supported an explosion of life and continental musical chairs.
Duration: 1 hr

Quiz: The Past is Vast
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

LESSON 3: NO TIME LIKE THE PRESENT

Study: Now Means Now
Trace the dramatic, climactic changes of the Cenozoic era and discover how scientists study early humans.
Duration: 1 hr

Quiz: Now Means Now
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

Discuss: On the Brink
Discuss extinction from an Earth science point of view with your classmates.
Duration: 0 hrs 30 mins Scoring: 25 points

Study: Understanding Laws, Theories, and Hypotheses
Learn the scientific definitions of laws, theories, and hypotheses, and explore examples of each.
Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Understanding Laws, Theories, and Hypotheses
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Understanding Laws, Theories, and Hypotheses
Practice problem-solving skills related to concepts in the lesson.
Duration: 1 hr Scoring: 40 points

Journal: Theories and Laws
Reflect on the different of theories, hypotheses and laws
Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 4: ALL THE TIME IN THE WORLD WRAP-UP

Review: All the Time in the World
Prepare for the unit test by reviewing key concepts and skills.
Duration: 1 hr 30 mins

Test (CS): All the Time in the World
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 44 points

Test (TS): All the Time in the World
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 0 hrs 45 mins Scoring: 76 points

UNIT 7: EARTH'S ECOSYSTEMS

LESSON 1: ECOSYSTEMS

Study: Ecosystems and Biomes
Learn about what makes up an ecosystem and about different types of ecosystems.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Ecosystems and Biomes
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: Stability and Change in an Ecosystem
Learn how an ecosystem responds to change.
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Stability and Change in an Ecosystem
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Your Ecosystem
Reflect on the qualities of the ecosystem you live in
Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 2: THE BLUE PLANET

Study: An Oceanographic Voyage
Travel on a research vessel to learn how oceanographers study the ocean and its inhabitants.
Duration: 1 hr

Study: Fresh Water
Jump into lakes, swim down rivers, and prowl through wetlands as you explore freshwater on Earth.
Duration: 1 hr

Quiz: The Blue Planet
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 18 points

Discuss: Make a Big Splash

Discuss the necessity of clean water and what you can do to protect this valuable resource.

Duration: 0 hrs 30 mins Scoring: 25 points

LESSON 3: MATTER AND ENERGY

Study: Relationships in an Ecosystem

Learn about the types of relationships between organisms in an ecosystem.

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Relationships in an Ecosystem

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Energy in the Food Web

Learn about how energy flows through ecosystems in complex food webs

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Energy in the Food Web

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Matter and Energy

Practice problem-solving skills related to concepts in the lesson.

Duration: 1 hr Scoring: 25 points

LESSON 4: EARTH'S ECOSYSTEMS WRAP-UP

Review: Earth's Ecosystems

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Earth's Ecosystems

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 40 points

Test (TS): Earth's Ecosystems

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 1 hr Scoring: 60 points

UNIT 8: OUR CHANGING BIOSPHERE

LESSON 1: POPULATIONS

Study: Population Structure

Learn about factors that affect populations.

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Population Structure

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Human Population

Learn about how the growing human population is impacting the earth

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Human Population

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: SOLUTIONS FOR THE FUTURE

Study: Sustaining Resources

Learn about how science can impact the use of resources and waste management

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Sustaining Resources
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: Saving Water
Learn what groundwater is and how it influences systems above ground.
Duration: 0 hrs 30 mins

Quiz: Saving Water
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 30 mins Scoring: 20 points

Journal: Your Water Diet
Reflect on how much water you consume each day. Share your thoughts about preserving wetlands in your community.
Duration: 0 hrs 30 mins Scoring: 15 points

Practice: Solutions for the Future
Practice problem-solving skills related to concepts in the lesson.
Duration: 1 hr Scoring: 19 points

Lab: Simulate Sustainable Resource Management
Complete a virtual lab to simulate the effects of sustainable and unsustainable agricultural practices.
Duration: 1 hr 30 mins Scoring: 50 points

LESSON 3: EARTH'S RESOURCES

Study: Acid Rain and Brine Shrimp
Learn about pH acids and bases
Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Acid Rain and Brine Shrimp
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Acid Rain and Brine Shrimp
Perform a lab to observe the impacts of acid rain on the environment
Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Acid Rain and Brine Shrimp
Discuss the results of your lab.
Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: OUR CHANGING BIOSPHERE WRAP-UP

Review: Our Changing Biosphere
Prepare for the unit test by reviewing key concepts and skills.
Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Our Changing Biosphere
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 42 points

Test (TS): Our Changing Biosphere
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 1 hr Scoring: 58 points

UNIT 9: ENERGY MATTERS

LESSON 1: ENERGY IN THE WORLD

Study: Fossil Fuels
Learn about the chemistry of fossil fuels, and about the environmental issues connected to fossil fuels.
Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Fossil Fuels
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: Alternative Fuels
Learn about biofuels, nuclear energy, and other alternative fuel sources.
Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Alternative Fuels
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Journal: You Decide
Write about topics in chemistry that connect to daily life.
Duration: 0 hrs 40 mins Scoring: 20 points

Discuss: The Buzz
Discuss the costs and benefits of alternative energy sources with your classmates.
Duration: 0 hrs 30 mins Scoring: 25 points

Project: Evaluate Wave and Tidal Power Technology
Complete a project to quantify how burning fossil fuels is affecting climate change and evaluate the potential of wave and tidal power to reduce those impacts.
Duration: 1 hr 30 mins Scoring: 50 points

Project: Choosing Energy Solutions
Complete a project to make decisions about energy sources, first as a government leader in a game and then as an engineer using a cost-benefit analysis.
Duration: 1 hr 30 mins Scoring: 50 points

LESSON 2: NUCLEAR ENERGY

Study: Nuclear Energy
Learn about the two types of nuclear energy: fission and fusion.
Duration: 1 hr

Quiz: Nuclear Energy
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: EARTH MATTERS

Study: Earth Matters
Explore case studies to see why Earth matters. Or just pick up a newspaper — chances are there's an Earth science issue being discussed in your community right now.
Duration: 1 hr

Quiz: Earth Matters
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Environmental Journalism
Write an article about an environmental issue as if you were writing for your local newspaper.
Duration: 1 hr Scoring: 50 points

LESSON 4: ENERGY MATTERS WRAP-UP

Review: Energy Matters

Prepare for the unit test by reviewing key concepts and skills.

Duration: 1 hr 30 mins

Test (CS): Energy Matters

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 40 points

Test (TS): Energy Matters

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 45 mins Scoring: 60 points

UNIT 10: SEMESTER 2 REVIEW AND EXAM

LESSON 1: SEMESTER 2 REVIEW AND EXAM

Review: Semester 2 Review

Prepare for the semester exam by reviewing key concepts covered in this semester.

Duration: 1 hr Scoring: 0 points

Exam: Semester 2 Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 30 mins Scoring: 96 points

Final Exam: Semester 2 Exam

Take a teacher-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 1 hr Scoring: 95 points