

*Physics of the Universe* integrates physics with Earth and space science. Throughout the course, students apply fundamental physics concepts to better understand the impact of human activities on Earth's systems and how forces, energy, and matter interact throughout the universe.

Course topics include electricity and magnetism, energy consumption and resources, dynamics, momentum and gravitation, waves, cosmology, and an exploration of Earth's physical systems.

Students discover new concepts through guided instruction and confirm their understanding in an interactive, feedback-rich environment. Scientific inquiry skills are embedded in the direct instruction, wherein students learn to ask scientific questions, form and test hypotheses, and use logic and evidence to draw conclusions about the concepts.

A variety of activities encourage students to think scientifically. Lab and Project activities reinforce critical thinking, writing, and communication skills and help students develop a deeper understanding of the nature of science and engineering. Virtual Lab activities enable students to engage in investigations that require long periods of observation at remote locations and to explore simulations that allow scientists to test predictions. In Discussions, students compare their lab or project results and exchange ideas about their investigations. Checkup and Practice activities provide additional opportunities for students to apply learned concepts and practice their writing and scientific reasoning skills.

This course is built to Next Generation Science Standards. Throughout the course, students are evaluated via a variety of assessments designed to prepare them for the content, form, and depth of state exams.

## UNIT 1: INTRODUCTION TO PHYSICS OF THE UNIVERSE

### LESSON 1: MATH IN PHYSICS

#### **Study: Algebra in Physics**

Review basic algebra skills.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Algebra in Physics**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Study: Units and Measurement**

Review the usefulness of using units in scientific measurement; learn about significant figures and measurement error; learn about SI units; convert between units.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Units and Measurement**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Study: Graphing**

Learn about different types of graphs and their suitability for sets of data; learn how to graph data as well as interpolate and extrapolate data based on a graph.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Graphing**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Checkup: Math in Physics**

Checkup and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

## LESSON 2: MATH FOR MOTION

### Study: Introduction to Vectors

Learn the difference between scalar and vector quantities and how to use vectors appropriately.

Duration: 1 hr Scoring: 0 points

### Quiz: Introduction to Vectors

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Study: Vector Operations

Learn how to add vector quantities by resolving into their components.

Duration: 1 hr Scoring: 0 points

### Quiz: Vector Operations

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Study: Trigonometry

Learn how trigonometry is applied to physics problems involving angles.

Duration: 1 hr Scoring: 0 points

### Quiz: Trigonometry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Checkup: Math for Motion

Checkup and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

## LESSON 3: INTRODUCTION TO PHYSICS OF THE UNIVERSE 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

## UNIT 2: ENERGY IN THE UNIVERSE

### LESSON 1: ENERGY AND FORCES

#### Study: Types of Energy

Learn about different types of energy and examples of each type.

Duration: 1 hr Scoring: 0 points

#### Quiz: Types of Energy

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Study: Forces

Learn about the four fundamental forces and how the strengths of the different forces vary with distance.

Duration: 1 hr Scoring: 0 points

#### Quiz: Forces

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 2: CONSERVATION OF ENERGY

**Study: Calculating Energy**

Learn how to calculate the kinetic energy of a moving object and the potential energy of a system; learn how temperature is related to the kinetic energy of molecules.

Duration: 1 hr Scoring: 0 points

**Quiz: Calculating Energy**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Study: Conservation of Energy**

Learn how energy transforms and is conserved in simple and complex systems; learn how to perform calculations that illustrate the law of conservation of energy.

Duration: 1 hr Scoring: 0 points

**Quiz: Conservation of Energy**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Study: Work and Power**

Learn how to differentiate between energy and work and between work and power; learn how to calculate work done and power produced in simple systems.

Duration: 1 hr Scoring: 0 points

**Quiz: Work and Power**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Checkup: Energy Conversions and Calculations**

Checkup and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

**Practice: Energy and Heat**

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

Duration: 0 hrs 40 mins Scoring: 25 points

**LESSON 3: DOING SCIENCE: ENERGY IN THE UNIVERSE****Study: Physics Experiments**

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

**Quiz: Physics Experiments**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Lab: Conservation of Energy**

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

**Discuss: Conservation of Energy**

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

**LESSON 4: ENERGY IN THE UNIVERSE 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.

## UNIT 3: ELECTRICITY AND MAGNETISM

### LESSON 1: ELECTRICITY

#### Study: Electrostatics

Learn how to determine the force between two electric charges; learn how to calculate an electric field; learn how to use the right-hand rule to determine the direction of an electric force.

Duration: 1 hr Scoring: 0 points

#### Quiz: Electrostatics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Study: Electrical Potential and Capacitance

Learn the difference between an electric field; potential energy; potential difference; and capacitance; learn how to perform calculations on electrical systems using these concepts.

Duration: 1 hr Scoring: 0 points

#### Quiz: Electrical Potential and Capacitance

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 2: ELECTRICAL CIRCUITS

#### Study: Current and Resistance

Learn about relationships between current; voltage; resistance; and power; learn how to solve problems using Ohm's law and how to calculate energy dissipation in a resistor.

Duration: 1 hr Scoring: 0 points

#### Quiz: Current and Resistance

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Study: Series Circuits

Learn how to diagram series circuits; learn how to determine the current; resistance; or voltage in a circuit; differentiate between complete; open; and short circuits.

Duration: 1 hr Scoring: 0 points

#### Quiz: Series Circuits

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Study: Parallel and Combined Circuits

Learn how to diagram parallel and combined circuits; learn how to determine the current; resistance; or voltage in a parallel circuit.

Duration: 1 hr Scoring: 0 points

#### Quiz: Parallel and Combined Circuits

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 3: MAGNETISM AND ELECTROMAGNETISM

#### Study: Magnetism

Learn about properties of magnetic fields.

Duration: 1 hr Scoring: 0 points

#### Quiz: Magnetism

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Study: Electromagnetism**

Learn how magnetic fields can produce electric fields, and vice versa; learn about properties of electromagnetic waves.

Duration: 1 hr Scoring: 0 points

**Quiz: Electromagnetism**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Practice: Electricity and Magnetism**

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

Duration: 0 hrs 40 mins Scoring: 25 points

**LESSON 4: DOING SCIENCE: ELECTRICITY AND MAGNETISM****Study: Testing Scientific Solutions**

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

**Quiz: Testing Scientific Solutions**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Lab: Circuit Building**

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

**Discuss: Circuit Building**

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

**Project: Interactions of Electric and Magnetic Fields**

Plan and conduct an investigation into the relationship between electric currents and magnetic fields.

Duration: 3 hrs Scoring: 50 points

**LESSON 5: ELECTRICITY AND MAGNETISM 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

**UNIT 4: ENERGY CONSUMPTION AND RESOURCES****LESSON 1: INTRODUCTION TO ENERGY RESOURCES****Study: Natural Resources**

Learn about renewable and nonrenewable resources.

Duration: 1 hr Scoring: 0 points

**Quiz: Natural Resources**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Study: Fossil Fuels**

Learn about fossil fuels.

Duration: 1 hr Scoring: 0 points

**Quiz: Fossil Fuels**

Take a quiz to assess your understanding of the material.

## LESSON 2: ENERGY CONSUMPTION AND CLIMATE CHANGE

### Study: Climate Change

Describe effects of air pollution on the natural systems that regulate Earth's climate. Analyze the historical trends observed in global climate data. Relate human activities to observed changes in global climate. Evaluate differing views on global warming and climate change.

Duration: 1 hr Scoring: 0 points

### Quiz: Climate Change

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Study: Effects of Climate Change

Summarize scientists' predictions about the effects of global climate change on the biosphere. Evaluate differing views on global warming and climate change.

Duration: 1 hr Scoring: 0 points

### Quiz: Effects of Climate Change

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Checkup: Energy Consumption and Climate Change

Checkup and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

## LESSON 3: ENERGY RESOURCES AND SUSTAINABILITY

### Study: Energy Technology Trade-Offs

Learn about energy technology trade-offs.

Duration: 1 hr Scoring: 0 points

### Quiz: Energy Technology Trade-Offs

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Study: Alternative Energy Resources

Describe how the use of natural resources will affect future generations of humans. Describe alternative forms of energy production.

Duration: 1 hr Scoring: 0 points

### Quiz: Alternative Energy Resources

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

## LESSON 4: DOING ENGINEERING: ENERGY CONSUMPTION AND RESOURCES

### Study: Introduction to Engineering

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

### Quiz: Introduction to Engineering

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Project: Investigate Passive Heating and Cooling

Investigate passive heating and cooling.

Duration: 3 hrs Scoring: 50 points

### Discuss: Investigate Passive Heating and Cooling

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

### **Project: Design an Energy-Conversion Device**

Design an energy-conversion device.

Duration: 3 hrs Scoring: 50 points

## **LESSON 5: ENERGY IN THE UNIVERSE 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

## **UNIT 5: DYNAMICS**

### **LESSON 1: FORCE AND MOTION**

#### **Study: Newton's Laws**

Learn how Newton's laws can be applied to everyday situations.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Newton's Laws**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Study: Force Problems**

Learn how to construct and interpret free-body diagrams for situations involving both balanced and unbalanced forces.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Force Problems**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **LESSON 2: CALCULATIONS WITH FORCES**

#### **Study: Free-Body Diagrams**

Learn how to solve problems using Newton's second law and how to do calculations involving force and work.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Free-Body Diagrams**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Study: Multiple Forces**

Learn how to determine the change of motion of an object acted on by multiple forces; how to solve two-dimensional problems involving balanced forces; and how to calculate the net force on an object.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Multiple Forces**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Checkup: Calculations with Forces**

Checkup and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

### **LESSON 3: DOING SCIENCE: DYNAMICS**

#### **Study: Errors in Experiments**

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

### Quiz: Errors in Experiments

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Lab: Newton's Laws

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

## LESSON 4: DYNAMICS 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

## UNIT 6: SEMESTER WRAP-UP

### LESSON 1: SEMESTER REVIEW AND EXAM

#### Review: Semester Review

Prepare for the final exam by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

#### Exam: Semester 1 Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in Semester 1.

Duration: 0 hrs 40 mins Scoring: 100 points

## UNIT 7: MOMENTUM AND GRAVITATION

### LESSON 1: MOMENTUM

#### Study: Momentum

Learn how to differentiate between force and energy and between energy and momentum; learn how to calculate the momentum of a mechanical system.

Duration: 1 hr Scoring: 0 points

#### Quiz: Momentum

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Study: Conservation of Momentum

Learn how to solve problems involving conservation of momentum and elastic/inelastic collision situations.

Duration: 1 hr Scoring: 0 points

#### Quiz: Conservation of Momentum

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Checkup: Momentum

Checkup and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

#### Practice: Two-Dimensional Collisions

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

Duration: 0 hrs 40 mins Scoring: 25 points

### LESSON 2: PLANETARY PHYSICS

#### Study: Orbits



Learn how to describe the motion of satellites and planets and how to solve problems involving the gravitational force between two objects.

Duration: 1 hr Scoring: 0 points

### **Quiz: Orbits**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Practice: Gravitation**

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

Duration: 0 hrs 40 mins Scoring: 25 points

## **LESSON 3: DOING SCIENCE: COLLISIONS**

### **Study: Organizing and Analyzing Experimental Results**

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

### **Quiz: Organizing and Analyzing Experimental Results**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Project: Minimizing the Force of Collisions**

Design a device to minimize the force of a collision.

Duration: 3 hrs Scoring: 50 points

## **LESSON 4: MOMENTUM AND GRAVITATION 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

## **UNIT 8: WAVES**

### **LESSON 1: INTRODUCTION TO WAVE MOTION**

#### **Study: Introduction to Waves**

Learn about different types of waves; about properties of waves; and about how waves move; learn how to solve problems involving wave speed; frequency; and wavelength.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Introduction to Waves**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Lab: Wave Motion**

Complete a lab on waves using coiled springs.

Duration: 1 hr Scoring: 50 points

#### **Discuss: Wave Motion**

Discuss wave properties.

Duration: 0 hrs 20 mins Scoring: 15 points

#### **Study: Wave Interactions**

Learn about how waves interact with media and with other waves; learn the differences between constructive and destructive interference.

Duration: 1 hr Scoring: 0 points

**Quiz: Wave Interactions**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Checkpoint: Introduction to Wave Motion**

Checkpoint and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

**LESSON 2: SOUND AND LIGHT****Study: Sound**

Learn about the properties of sound waves; about the Doppler effect with respect to sound waves; and about practical applications of sound waves in technology and engineering.

Duration: 1 hr Scoring: 0 points

**Quiz: Sound**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Study: Light**

Learn about the regions of the electromagnetic spectrum and how electromagnetic waves travel; learn how to solve problems involving electromagnetic wave speed; frequency; and wavelength; learn about engineering applications of electromagnetic waves.

Duration: 1 hr Scoring: 0 points

**Quiz: Light**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Checkpoint: Sound and Light**

Checkpoint and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

**LESSON 3: LIGHT TECHNOLOGY****Study: Introduction to Optics**

Learn how to draw and interpret ray diagrams; learn about the process of image formation; learn how light reflects and refracts.

Duration: 1 hr Scoring: 0 points

**Quiz: Introduction to Optics**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Study: Wave-Particle Duality**

Learn about the dual nature of light and key experiments that led to the current understanding of the nature of light; learn about the concept of quantization.

Duration: 1 hr Scoring: 0 points

**Quiz: Wave-Particle Duality**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

**Study: Applications of Electromagnetic Radiation**

Learn about applications of electromagnetic radiation.

Duration: 1 hr Scoring: 0 points

**Quiz: Applications of Electromagnetic Radiation**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Checkpoint: Light Technology**

Checkpoint and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

## **LESSON 4: DOING SCIENCE: EVALUATING SCIENTIFIC CLAIMS**

### **Study: Evaluating Scientific Claims**

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

### **Quiz: Evaluating Scientific Claims**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Project: Effects of Electromagnetic Radiation on Matter**

Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.

Duration: 3 hrs Scoring: 50 points

## **LESSON 5: WAVES 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

## **UNIT 9: COSMOLOGY**

### **LESSON 1: ORIGINS OF THE UNIVERSE**

#### **Study: The Universe**

Learn how our universe formed and about its general structure.

Duration: 1 hr Scoring: 0 points

#### **Quiz: The Universe**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Study: The Big Bang Theory**

Learn about the development of the big bang theory.

Duration: 1 hr Scoring: 0 points

#### **Quiz: The Big Bang Theory**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Study: Formation and Structure of Matter**

Learn how competing forces within the nucleus determine its stability; learn how to differentiate between nuclear and chemical reactions; learn how to apply Einstein's mass-energy equivalence formula to nuclear reactions.

Duration: 1 hr Scoring: 0 points

#### **Quiz: Formation and Structure of Matter**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### **Checkpoint: Origins of the Universe**

Checkpoint and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

### **Practice: Origins of the Universe**

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

Duration: 0 hrs 20 mins Scoring: 10 points

## **LESSON 2: STARS**

### **Study: Fusion and Fission**

Learn about the processes of fission and fusion.

Duration: 1 hr Scoring: 0 points

### **Quiz: Fusion and Fission**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Study: Our Sun**

Learn about characteristics of the Sun.

Duration: 1 hr Scoring: 0 points

### **Quiz: Our Sun**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Study: Star Life Cycles**

Learn how stars form and change over time.

Duration: 1 hr Scoring: 0 points

### **Quiz: Star Life Cycles**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Practice: Stars**

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

Duration: 0 hrs 20 mins Scoring: 10 points

## **LESSON 3: OUR SOLAR SYSTEM**

### **Study: Formation of the Solar System**

Learn how the solar system, Earth, and the Moon formed.

Duration: 1 hr Scoring: 0 points

### **Quiz: Formation of the Solar System**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Study: Radioactivity and Half-Life**

Learn about the processes of radioactive decay and the factors that determine the level of danger from various radiation sources; learn how to solve problems using half-life calculations; learn about useful and peaceful applications for nuclear processes.

Duration: 1 hr Scoring: 0 points

### **Quiz: Radioactivity and Half-Life**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Checkup: Radioactivity and Half-Life**

Checkup and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

### **Explore: Radioactive Dating and the Earth**

Explore a topic that relates to the concepts in the lesson by applying scientific methods of analysis.

Duration: 1 hr 30 mins Scoring: 25 points

## LESSON 4: DOING SCIENCE: MODELING NUCLEAR REACTIONS

### Study: Scientific Models

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

### Quiz: Scientific Models

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### Lab: Nuclear Physics

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

### Discuss: Nuclear Physics Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

## LESSON 5: COSMOLOGY 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

## UNIT 10: GEOPHYSICS

### LESSON 1: THE GEOSPHERE

#### Study: Earth's Structure

Learn about the parts of Earth's geosphere.

Duration: 1 hr Scoring: 0 points

#### Quiz: Earth's Structure

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Study: The Rock Cycle

Learn how different types of rock form.

Duration: 1 hr Scoring: 0 points

#### Quiz: The Rock Cycle

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### LESSON 2: EARTH'S PLATES

#### Study: Theory of Continental Drift

Learn about the theory of continental drift and the evidence used to support it.

Duration: 1 hr Scoring: 0 points

#### Quiz: Theory of Continental Drift

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

#### Study: Plate Tectonics

Learn about Earth's tectonic plates and how they interact with one another.

Duration: 1 hr Scoring: 0 points

#### Quiz: Plate Tectonics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Checkpoint: Earth's Tectonic Plates**

Checkpoint and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

## **LESSON 3: OUR CHANGING PLANET**

### **Study: Deforming Earth's Crust**

Learn how the forces that causes the movement of tectonic plates causes Earth's crust to deform.

Duration: 1 hr Scoring: 0 points

### **Quiz: Deforming Earth's Crust**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Study: Earthquakes and Volcanoes**

Learn the causes and effects of earthquakes and volcanoes.

Duration: 1 hr Scoring: 0 points

### **Quiz: Earthquakes and Volcanoes**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Study: Weathering and Erosion**

Learn how weathering and erosion break down and build up landforms.

Duration: 1 hr Scoring: 0 points

### **Quiz: Weathering and Erosion**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Checkpoint: Our Changing Planet**

Checkpoint and apply what you have learned.

Duration: 0 hrs 20 mins Scoring: 0 points

## **LESSON 4: MODELING GEOLOGIC PROCESSES**

### **Study: Investigate Weathering and Erosion**

Formulate a hypothesis and design a controlled experiment to test it. Describe common laboratory tools and techniques used to conduct the experiment you designed.

Duration: 1 hr Scoring: 0 points

### **Quiz: Investigate Weathering and Erosion**

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

### **Lab: Investigate Weathering and Erosion**

Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.

Duration: 1 hr Scoring: 50 points

### **Discuss: Investigate Weathering and Erosion**

Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.

Duration: 0 hrs 20 mins Scoring: 15 points

### **Project: Modeling Geologic Processes**

Model two different landforms and the mantle's convection currents.

Duration: 3 hrs Scoring: 50 points

## LESSON 5: GEOPHYSICS 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

## UNIT 11: SEMESTER WRAP-UP

### LESSON 1: SEMESTER REVIEW AND EXAM

#### Review: Semester Review

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

Duration: 0 hrs 30 mins Scoring: 0 points

#### Exam: Semester 2 Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in Semester 2.

Duration: 0 hrs 40 mins Scoring: 100 points