

Physics offers a curriculum that emphasizes students' understanding of fundamental physics concepts while helping them acquire tools to be conversant in a society highly influenced by science and technology.

The course provides students with opportunities to learn and practice critical scientific skills within the context of relevant scientific questions. Topics include the nature of science, math for physics, energy, kinematics, force and motion, momentum, gravitation, chemistry for physics, thermodynamics, electricity, magnetism, waves, nuclear physics, quantum physics, and cosmology.

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. Lab activities reinforce critical thinking, writing, and communication skills and help students develop a deeper understanding of the nature of science.

Throughout this course, students are given an opportunity to understand how physics concepts are applied in technology and engineering. Journal and Practice activities provide additional opportunities for students to apply learned concepts and practice their writing skills.

This course is built to state standards and informed by the American Association for the Advancement of Science (AAAS) Project 2061 benchmarks and the National Science Education Standards.

Length: Two semesters

UNIT 1: INTRODUCTION TO PHYSICS

LESSON 1: THE PROCESS OF SCIENCE

Study: The Nature of Physics

Learn what is and is not science; what the study of physics is; tools used by scientists; and the role of science in society.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: The Nature of Physics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Scientific Methods

Learn about designing and performing experiments and collecting data.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Scientific Methods

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Pseudoscience Around You

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 2: MATH IN PHYSICS

Study: Algebra in Physics

Review basic algebra skills.

Duration: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins Scoring: 0 points

Quiz: Graphing

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: MATH FOR MOTION**Study: Introduction to Vectors**

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

Duration: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins Scoring: 0 points

Quiz: Trigonometry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Introduction to Physics

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: INTRODUCTION TO PHYSICS**Study: Physics and the World**

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Physics and the World

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Measuring and Estimating

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Measuring and Estimating Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: INTRODUCTION TO PHYSICS 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: 1 hr 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: ENERGY

LESSON 1: ENERGY AND FORCES

Study: Types of Energy

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

Duration: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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

Journal: Energy and You

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 3: USEFUL ENERGY

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: 0 hrs 45 mins 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

Study: Machines and Efficiency

Learn about different types of simple machines and their mechanical advantages; learn how to calculate work done by simple machines.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Machines and Efficiency

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Energy and Sustainability

Learn about the advantages and disadvantages of different energy sources; learn how to apply scientific reasoning to analyze socially relevant energy issues.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Energy and Sustainability

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Energy

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: ENERGY

Study: Physics Experiments

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins 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 30 mins Scoring: 50 points

Discuss: Conservation of Energy Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: ENERGY 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: 1 hr 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 3: KINEMATICS

LESSON 1: DISPLACEMENT, VELOCITY, AND ACCELERATION

Study: Displacement and Velocity

Learn how to solve problems involving distance; speed; time; and velocity; learn how to draw and interpret a position-time graph.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Displacement and Velocity

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Acceleration

Learn how to solve problems involving acceleration; learn how acceleration relates to velocity; to displacement; and to time.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Acceleration

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Free Fall

Learn how to solve problems involving the force of gravity acting on an object.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Free Fall

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Vectors and Motion

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 2: NONLINEAR MOTION

Study: Projectile Motion

Learn how to solve problems involving two-dimensional trajectories.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Projectile Motion

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Circular Motion

Learn how to solve problems involving circular motion.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Circular Motion

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Relative Motion

Learn about frames of reference; learn how to solve motion problems using a variety of frames of reference.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Relative Motion

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Kinematics

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 3: DOING SCIENCE: KINEMATICS

Study: Organizing and Analyzing Experimental Results

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins 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

Lab: Kinematics

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Kinematics Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: KINEMATICS 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: 1 hr 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 4: DYNAMICS

LESSON 1: FORCE AND MOTION

Study: Newton's Laws

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

Duration: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins Scoring: 0 points

Quiz: Multiple Forces

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Friction

Learn how to differentiate between static and kinetic friction and how to solve problems involving frictional forces.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Friction

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Friction and You

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

Practice: Dynamics

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 3: DOING SCIENCE: DYNAMICS**Study: Errors in Experiments**

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins 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: Force of Friction

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Force of Friction Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 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: 1 hr 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 5: 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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

LESSON 2: HARMONIC MOTION

Study: Harmonic Motion

Learn how to apply the law of conservation of energy to situations involving harmonic motion and how to perform calculations involving Hooke's law.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Harmonic Motion

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Rhythm in Your Life

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 3: 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: 0 hrs 45 mins Scoring: 0 points

Quiz: Orbits

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Momentum and Gravitation

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: MOMENTUM AND GRAVITATION

Study: Evaluating Scientific Conclusions

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: Evaluating Scientific Conclusions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Simple Harmonic Motion

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Simple Harmonic Motion Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: 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: 1 hr 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 6: SEMESTER 1 REVIEW AND EXAM

LESSON 1: SEMESTER 1 REVIEW AND EXAM

Review: Semester 1

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

Duration: 1 hr Scoring: 0 points

Exam: Semester 1

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

Duration: 1 hr Scoring: 100 points

Final Exam: Semester 1

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

Duration: 1 hr Scoring: 100 points

UNIT 7: CHEMICAL PHYSICS

LESSON 1: CHEMISTRY FOR PHYSICS

Study: Atomic Structure and the Periodic Table

Learn about the structure of an atom; learn how to use the periodic table to find information about atoms; learn about the history of atomic theory.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Atomic Structure and the Periodic Table

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Chemical Bonds

Learn how molecules are different from atoms; learn how molecules form; learn how molecules bond to other molecules.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Chemical Bonds

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Elements in Daily Life

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 2: INTRODUCTION TO STATES OF MATTER

Study: Movement in Matter

Learn about the various states of matter in terms of kinetic molecular theory; learn why molecules move and how their movements can be measured.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Movement in Matter

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Fluid Dynamics and Buoyancy

Learn about and apply Archimedes' and Bernoulli's principles; learn about and apply Pascal's principle; learn about the unique properties of water.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Fluid Dynamics and Buoyancy

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Chemical Physics

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 3: DOING SCIENCE: CHEMICAL PHYSICS

Study: The People of Science

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins Scoring: 0 points

Quiz: The People of Science

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Fluids

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Fluids Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: CHEMICAL PHYSICS 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: 1 hr 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 8: THERMODYNAMICS

LESSON 1: LAWS OF THERMODYNAMICS

Study: Potential Energy in Chemical Reactions

Learn what enthalpy and entropy are; learn the difference between exothermic and endothermic reactions; learn how to draw a potential energy diagram for a chemical reaction.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Potential Energy in Chemical Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: First Law of Thermodynamics

Learn about the first and second laws of thermodynamics and how to apply them; learn about differences between open, closed, and isolated systems.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: First Law of Thermodynamics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Second Law of Thermodynamics

Learn how to compare and contrast different methods of heat flow.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Second Law of Thermodynamics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: ENERGY CHANGE

Study: Heat Flow

Learn how work is done in a heat engine and what factors affect its efficiency

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Heat Flow

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Heating, Cooling, and Phase Changes

Learn how to solve problems using specific heat capacity and latent heat values; learn how to determine the final temperature when two objects of different temperatures are in contact.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Heating, Cooling, and Phase Changes

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Thermodynamics

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

Duration: 1 hr 30 mins Scoring: 25 points

Journal: Endothermic and Exothermic Reactions

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 3: DOING SCIENCE: THERMODYNAMICS

Study: Scientific Models

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins 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: Thermodynamics

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Thermodynamics Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: THERMODYNAMICS 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: 1 hr 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 9: 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 0 hrs 45 mins 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

Journal: Circuits in Your Home

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 3: MAGNETISM AND ELECTROMAGNETISM

Study: Magnetism

Learn about properties of magnetic fields.

Duration: 0 hrs 45 mins 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: 0 hrs 45 mins 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: 1 hr 30 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: ELECTRICITY AND MAGNETISM

Study: Testing Scientific Solutions

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins 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 30 mins Scoring: 50 points

Discuss: Circuit Building

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 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: 1 hr 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 10: 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: 0 hrs 45 mins 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

Study: Wave Interactions

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

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Wave Interactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 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: 0 hrs 45 mins 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: 0 hrs 45 mins Scoring: 0 points

Quiz: Light

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Sounds You Hear

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

LESSON 3: OPTICS

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: 0 hrs 45 mins 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: Lenses and Mirrors

Learn how to solve problems using lens and mirror equations.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Lenses and Mirrors

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Waves

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: WAVES

Study: Applications of Electromagnetic Radiation

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins 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

Lab: Optics

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Optics Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 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: 1 hr 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 11: MODERN PHYSICS

LESSON 1: NUCLEAR PHYSICS

Study: Nuclear Structure

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: 0 hrs 45 mins Scoring: 0 points

Quiz: Nuclear Structure

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: 0 hrs 45 mins 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

Study: Fission and Fusion

Learn about fission and fusion; learn about common examples of each; learn how forces in the nucleus affect the likelihood of fission or fusion occurring.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Fission and Fusion

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: QUANTUM PHYSICS

Study: Atomic Physics and Quantization

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: 0 hrs 45 mins Scoring: 0 points

Quiz: Atomic Physics and Quantization

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Introduction to Relativity

Learn about the importance of the concept of relativity and the difference between general and special relativity; learn about the connection between Newton's laws and Einstein's special theory of relativity; learn about the difference between quantum and Newtonian mechanics.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Introduction to Relativity

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: COSMOLOGY

Study: Cosmology

Learn about the development of the big bang theory.

Duration: 0 hrs 45 mins Scoring: 0 points

Quiz: Cosmology

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: What Do You Think about the Big Bang?

Write about topics in physics that connect to daily life.

Duration: 0 hrs 40 mins Scoring: 20 points

Practice: Modern Physics

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

Duration: 1 hr 30 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: MODERN PHYSICS

Study: Evaluating Scientific Claims

Learn about the process of scientific inquiry.

Duration: 0 hrs 40 mins 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

Lab: Nuclear Physics

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr 30 mins Scoring: 50 points

Discuss: Nuclear Physics Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: MODERN PHYSICS 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: 1 hr 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 12: SEMESTER 2 REVIEW AND EXAM**LESSON 1: SEMESTER 2 REVIEW AND EXAM****Review: Semester 2**

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

Duration: 1 hr Scoring: 0 points

Exam: Semester 2

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

Duration: 1 hr Scoring: 100 points

Final Exam: Semester 2

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

Duration: 1 hr Scoring: 100 points