Chemistry offers a curriculum that emphasizes students' understanding of fundamental chemistry 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, the importance of chemistry to society, atomic structure, bonding in matter, chemical reactions, redox reactions, electrochemistry, phases of matter, equilibrium and kinetics, acids and bases, thermodynamics, quantum mechanics, nuclear reactions, organic chemistry, and alternative energy.

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 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 chemistry 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.

Length: Two Semesters

UNIT 1: MATTER, FORCES, AND ENERGY

LESSON 1: MATTER

Study: Matter and Gravity
Learn about matter, the law of conservation of matter, and the forces that act on matter.
Duration: 1 hr Scoring: 0 points

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

Study: Newton's Law of Gravitation
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: Newton's Law of Gravitation
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Gravitational Force
Practice problem-solving skills related to concepts in the lesson.
Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 2: ENERGY AND FORCES

Study: Types of 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: Types of Forces
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: Electric Force

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: Electric Force

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Magnetic Force

Learn about properties of magnetic fields.

Duration: 1 hr Scoring: 0 points

Quiz: Magnetic Force

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Electric and Magnetic Force

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

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 3: CONSERVATION OF ENERGY

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: 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

Journal: Energy and Change

Write about topics in chemistry that connect to daily life.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 4: DOING SCIENCE: MATTER, FORCES, AND ENERGY

Study: Science Experiments

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

Quiz: Science 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 Lab
Discuss the results of your lab.
Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: MATTER, FORCES, AND 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: 0 hrs 30 mins Scoring: 50 points

UNIT 2: ATOMS AND THE PERIODIC TABLE

LESSON 1: ATOMS

Study: Atomic Structure
Learn about how all matter is made of atoms; learn about the history of atomic theory; understand the Bohr atom and the differences between neutrons, protons, and electrons.
Duration: 1 hr Scoring: 0 points

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

Study: The Periodic Table
Learn how to navigate the periodic table and use it to find numbers of protons, electrons, and neutrons.
Duration: 1 hr Scoring: 0 points

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

Journal: Simplifying Your View of Chemistry
Write about topics in chemistry that connect to daily life.
Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: ELEMENTS

Study: Organization and History of the Periodic Table
Learn about the history of the periodic table; the information in the periodic table; and how the table shows the unity, diversity, and organization of life.
Duration: 1 hr Scoring: 0 points

Quiz: Organization and History of the Periodic Table
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: Elements on the Periodic Table
Learn about the elements of the periodic table.
Duration: 1 hr Scoring: 0 points

Quiz: Elements on the Periodic Table
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Atomic Structure
Practice problem-solving skills related to concepts in the lesson.
Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 3: DOING SCIENCE: ATOMS AND THE PERIODIC TABLE

Study: Civil Engineering
Learn about the process of scientific inquiry.
Duration: 1 hr Scoring: 0 points

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

Lab: Mass, Volume, and Density
Use the scientific method and scientific skills to perform a lab experiment.
Duration: 1 hr Scoring: 50 points

Discuss: Mass, Volume, and Density
Discuss the results of your lab.
Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: ATOMS AND THE PERIODIC TABLE 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 3: BONDING IN MATTER

LESSON 1: ELECTRONS AND PERIODICITY

Study: Electrons and Orbitals
Learn about energy levels of electrons, electron configurations, and the filling of orbitals.
Duration: 1 hr Scoring: 0 points

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

Study: Predictions and the Periodic Table
Learn about the patterns in the periodic table and the information that can be gained by using the table.
Duration: 1 hr Scoring: 0 points

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

LESSON 2: BONDING AND FORCES

Study: Intramolecular Forces
Learn about forces within molecules, draw Lewis structures, and make predictions about the type of bond formed between two atoms.
Duration: 1 hr Scoring: 0 points

Quiz: Intramolecular Forces
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Intermolecular Forces
Learn about the forces between molecules and how they determine properties of substances.
Duration: 1 hr Scoring: 0 points

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

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

Study: Solutions
Learn about the properties of solutions, how mixtures are different from solutions, and what factors influence the rate of solution formation.
Duration: 1 hr Scoring: 0 points

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

LESSON 3: COMPOUNDS AND MOLECULES

Study: Molecular Shape
Learn how to predict molecular shape.
Duration: 1 hr Scoring: 0 points

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

Study: Naming Substances
Learn about naming and writing formulas for compounds.
Duration: 1 hr Scoring: 0 points

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

Practice: Bonding in Matter
Practice problem-solving skills related to concepts in the lesson.
Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: BONDING IN MATTER

Study: Food Engineering
Learn about the process of scientific inquiry.
Duration: 1 hr Scoring: 0 points

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

Lab: Periodic Properties
Use the scientific method and scientific skills to perform a lab experiment.
Duration: 1 hr Scoring: 50 points

Discuss: Periodic Properties
Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: BONDING IN MATTER 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: CHEMICAL REACTIONS AND STOICHIOMETRY

LESSON 1: THE MOLE AND CHEMICAL QUANTITIES

Study: Unit Conversions

Learn about moles and their main uses and how to perform unit conversions.

Duration: 1 hr Scoring: 0 points

Quiz: Unit Conversions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Molar Mass and Percent Composition

Learn how to use moles to determine mass percent composition, the empirical formula, and the molecular formula.

Duration: 1 hr Scoring: 0 points

Quiz: Molar Mass and Percent Composition

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: CHANGES IN MATTER

Study: Chemical Reactions

Learn how to define chemical reactions.

Duration: 1 hr Scoring: 0 points

Quiz: Chemical Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Types of Reactions

Learn about the main types of chemical reactions.

Duration: 1 hr Scoring: 0 points

Quiz: Types of Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Reactions Around You

Write about topics in chemistry that connect to daily life.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: STOICHIOMETRY

Study: Balancing Inorganic Reactions

Learn about balancing inorganic chemical reactions.

Duration: 1 hr Scoring: 0 points

Quiz: Balancing Inorganic Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Balancing Organic Reactions
Learn about the significance of organic reactions, such as combustion, and how to balance organic reactions.
Duration: 1 hr Scoring: 0 points

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

Study: Calculating with Balanced Equations
Learn how to calculate average atomic mass and theoretical yield of products, and how to determine the limiting reagent and the percent yield.
Duration: 1 hr Scoring: 0 points

Quiz: Calculating with Balanced Equations
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Chemical Reactions
Practice problem-solving skills related to concepts in the lesson.
Duration: 0 hrs 40 mins Scoring: 25 points

Practice: Stoichiometry
Practice problem-solving skills related to concepts in the lesson.
Duration: 0 hrs 40 mins Scoring: 10 points

LESSON 4: DOING SCIENCE: CHEMICAL REACTIONS AND STOICHIOMETRY

Study: Engines, Fuel, and Green Design
Learn about the process of scientific inquiry.
Duration: 1 hr Scoring: 0 points

Quiz: Engines, Fuel, and Green Design
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Stoichiometry and Conservation of Matter
Use scientific methods and skills to perform a lab experiment.
Duration: 1 hr Scoring: 50 points

Lab: Precipitation Reactions
Use the scientific method and scientific skills to perform a lab experiment.
Duration: 1 hr Scoring: 50 points

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

LESSON 5: CHEMICAL REACTIONS AND STOICHIOMETRY 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: PHASES, EQUILIBRIUM, AND KINETICS

LESSON 1: PHASES OF MATTER

Study: Kinetic Theory

Learn about how the kinetic theory explains phases.

Duration: 1 hr Scoring: 0 points

Quiz: Kinetic Theory

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Solids

Learn about the properties of solids, particularly metallic solids.

Duration: 1 hr Scoring: 0 points

Quiz: Solids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Melting and Boiling

Learn about how intermolecular forces affect melting points, and how addition of solute affects melting and freezing points.

Duration: 1 hr Scoring: 0 points

Quiz: Melting and Boiling

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: EQUILIBRIUM

Study: The Equilibrium Constant

Learn about the concept of equilibrium, and about what happens when equilibrium is disturbed.

Duration: 1 hr Scoring: 0 points

Quiz: The Equilibrium Constant

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Acid and Base Equilibrium

Learn about acids and bases, and about the equilibria of acids and bases.

Duration: 1 hr Scoring: 0 points

Quiz: Acid and Base Equilibrium

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Equilibrium

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

Duration: 0 hrs 40 mins Scoring: 10 points

LESSON 3: KINETICS

Study: Reaction Rate

Learn about reaction rate.

Duration: 1 hr Scoring: 0 points

Quiz: Reaction Rate

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Calculating the Reaction Rate

Learn about how to calculate reaction rate.

Duration: 1 hr Scoring: 0 points

Quiz: Calculating the Reaction Rate

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Kinetics

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

Duration: 0 hrs 40 mins Scoring: 10 points

LESSON 4: DOING SCIENCE: PHASES, EQUILIBRIUM, AND KINETICS

Lab: Freezing Point Depression

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Freezing Point Depression

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

Lab: Disturbing Equilibrium

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Disturbing Equilibrium

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: PHASES, EQUILIBRIUM, AND KINETICS WRAP-UP

Review: Unit Review: Phases, Equilibrium, and Kinetics

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