Eighth-Grade Science, Part 1 (GSCI-035-300-001)

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Syllabus

Course Description

In this course, you'll explore the tiny building blocks of everything around you—atoms and molecules. You'll learn what they're made of, how small they are, and how they act. You'll see how matter changes, what causes those changes, and how energy plays a big role. You'll study things like heat, density, and how substances can shift from solid to liquid to gas. You'll also study how energy moves, changes form, and affects motion. By the end of the course, you'll understand how matter and energy are connected in the world around you!

Prerequisites

There are no prerequisites for this course.

Course Materials and Technology

Students must buy these materials and technology to complete the course:

- A webcam for the proctored final exam

Course Outcomes

As students complete the course assignments, they will increase their knowledge, improve a 21st-century skill, and develop an attribute.

Knowledge: Eighth-Grade Science, Part 1

In this course, *knowledge* refers to the subject matter and content students will learn while completing the readings, practices, quizzes, and assignments.

On successful completion of this course, students will be able to do the following:

1. Develop models to describe the structure of atoms, including the number of protons, neutrons, and electrons for various elements.
2. Explain the scale and proportion of atoms and molecules through developed models.
3. Build models to represent the atomic composition and structure of simple molecules and extended structures.
4. Evaluate the properties of matter and how those properties allow it to be used in society.
5. Plan and conduct an investigation to identify patterns in a substance's properties and whether a chemical reaction has occurred.
6. Identify different phases of matter.
7. Calculate density when given information on volume and mass in a given state of matter.
8. Develop a Model to explain how adding or removing heat energy will cause a change in how molecules move and behave within a substance. (Speed and distance)
9. Develop a Model to explain how adding or removing heat energy will cause a substance to change its phase.
10. Build a device that affects the rate of phase change.
11. Develop a Model to show how the total number of atoms and the mass does not change in a chemical reaction.
12. Identify the Forms of Energy (Mechanical- Sound, Electromagnetic-Light, Chemical, Thermal, Electrical, Nuclear)
13. Explain how energy changes from one form of to another but is always conserved.
14. Collect evidence that supports the claim of kinetic energy changing as energy is transferred to or from an object.
15. Show the effect of changing the velocity and mass within a system on the amount of kinetic energy within that system.

16. Explore how potential energy changes as the mass, height, and distance within a system varies.
17. Conduct an experiment to explore potential energy and create models to describe how different object arrangements affect energy storage.
18. Explain the effect that friction has on converting mechanical energy into thermal energy.
19. Develop a model to describe how waves are reflected, absorbed, or transmitted through various materials.
20. Develop a model that describes how the amplitude of a wave relates to its energy.

21st-Century Skill: Idea Design and Refinement

As students complete this course's assignments, they will gain skills in idea design and refinement. This skill is part of the Creativity category.

Attribute: Integrity

This course focuses on developing the attribute of integrity in the context of science.

Grading and Assignments

The letter grade in this course will be based on these assignments and exams.

Assignment or Exam	Grading	Percent of Total Grade
Study Guides	Computer-Graded	15%
Application Projects	Teacher-Graded	50%
Module Quizzes	Computer-Graded	5%
Midcourse Quiz	Computer-Graded	10%
Final Exam*	Computer-Graded	20%

*Students must pass the final exam with a 60% or higher to earn credit for the course. They may retake the final exam once for a fee.

Due Dates

The due dates in the course are only suggestions to help the students pace themselves. You do *not* need to complete assignments, quizzes, and exams by the due date set in the course.

Study Guides

Study guides are provided for each module. They will help students focus on the important concepts needed to be successful in this course and in life. Study guides will be due in each module and points will be awarded upon submission.

Application Projects

Application projects give the students opportunities to apply the concepts they have learned to real-life situations, scenarios, and events. They also evaluate the students' mastery of the skill for the course.

Module Quizzes

Quizzes are administered at the end of each module. Each quiz is open-book/note and untimed. They consist entirely of multiple-choice questions and come directly from the lesson material and the videos.

Midcourse Quiz

This computer-graded quiz covers the material up to the midcourse quiz. The questions on the midcourse quiz are similar in format to the questions on the final exam.

Final Exam

Students must pass the final exam to earn credit for the course; they may retake it once, for a fee, upon request.

Course Grade

The letter grade will be calculated according to these percentages.

Percent to Letter Grade Calculation	
A	100%–93%
A–	<93%–90%
B+	<90%–87%
B	<87%–83%
B–	<83%–80%
C+	<80%–77%
C	<77%–73%
C–	<73%–70%
D+	<70%–67%
D	<67%–63%
D–	<63%–60%
F (fail)	<60%–0%