

SCI0800_202338_Staging_EMBR_TEM

SCI-800

2023 05/01/2023 to 04/30/2024 Modified 03/22/2023

Course Description

This full-year course introduces students to chemistry and physics. Students apply foundational skills such as critical thinking, scientific measurement, and graphing to various lessons and experiments about scientific laws related to the physical and chemical world. Major topics include the laws of Newton and Galileo, friction, pendulums, centripetal force, work, simple machines, types of energy, electricity, light, atomic theory, chemical reactions, and the behavior of matter. Students propose and investigate a scientific phenomenon by completing a science fair project. Throughout the course, students will investigate God's order and sense of balance in His creation and the mechanisms that maintain how the world works.

Rationale

This course offers students a deeper examination of the building blocks of nonliving materials and processes they can undergo. Knowledge of how these items are combined shows the design and purpose of an intelligent God, who created the earth and its laws through His son, Jesus Christ. Students will learn to discover and explain the order of the physical world and how its parts connect to one another.

Course Learning Outcomes

Biblical Integration Outcomes

A. The student will identify and describe Creation and the universe from a biblical worldview.

Measurable Learning Outcomes

- A. The student will apply the scientific method and analyze data through the method.
- B. The student will perform metric unit conversions.
- C. The student will investigate and understand the nature of matter, its properties, and the four phases of matter.
- D. The student will investigate and understand the historical and modern models of the atomic theory.
- E. The student will investigate and understand the organization of the periodic table.
- F. The student will investigate and understand chemical bonding.
- G. The student will investigate and understand the different forms of energy.
- H. The student will perform temperature scale conversions.
- I. The student will investigate and understand the difference between temperature and heat.
- J. The student will investigate and understand longitudinal waves (sound waves) and transverse waves (light).
- K. The student will investigate and understand work, force, motion, and their associated calculations.
- L. The student will describe and analyze the different types of simple machines.
- M. The student will investigate and understand the principles of electricity and magnetism.

Course Resources

See Ember's [Systems Requirements](#) for computer specifications necessary to operate this curriculum.

- Note: Embedded YouTube videos may be utilized to supplement Ember's YouTube videos are the property of the respective content creator, licensed to YouTube for distribution and user access. As a non-profit educational institution, Ember is able to use

* Course Policies

Types of Assessments

To simplify and clearly identify which policies apply to which assessment, each assessment has been categorized into one of four categories: Lesson, Assignment, Quiz, or Test. Each applicable item on the course Modules page has been designated with an identifier chosen from among these categories. Thus, a Quiz on the American Revolution may be designated by the title, "1.2.W Quiz: The American Revolution."

- **Lesson:** *Any item on the Modules page designated as a "Lesson"*

These include instructional content and sometimes an assessment of that content. Typically, a Lesson will be the day-to-day work that a student completes.

- **Assignment:** *Any item on the Modules page designated as an "Assignment"*

Typical examples of Assignments include, but are not limited to, papers, book reports, projects, labs, and speeches. Assignments are usually something that the student should do his or her best work on the first time.

- **Quiz:** *Any item on the Modules page designated as a "Quiz"*

This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Quizzes cover a smaller amount of material than Tests.

- **Test:** *Any item on the Modules page designated as a "Test"*

This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Tests cover a larger amount of material than Quizzes.

Materials Selection Policy

Ember curates educational materials that are consistent with the school's philosophy; however, the fallen human condition depicted in literature (as in Scripture itself) is not always pleasant. Valuable works sometimes have objectionable or profane elements. Good books provide four (4) recognized values.

- They build godly attitudes and character traits.
- They deepen our social and cultural awareness.
- They strengthen our use of written language.
- They provide a lifelong source of enjoyment and relaxation.

In order to instill these values in students and fulfill the stated objectives of the school, all Ember students are expected to read and study good books on a regular basis. Recognizing that materials designed for one level may not be appropriate for another, three (3) levels of criteria are applied:

- Elementary materials must contain no objectionable material,
- Objectionable elements in sixth through eighth-grade materials must be limited and must serve a specific educational purpose, and
- Objectionable content may be included in high school materials but must be outweighed by positive literary, curricular, and/or Christian values.

The curriculum department has approved required educational materials for students.

Resubmission Policy

Students are expected to submit their best work on the first submission for every Lesson, Assignment, Quiz, and Test. However, resubmissions may be permitted in the following circumstances:

- **Lesson:** Students are automatically permitted two attempts on a lesson. Students may freely resubmit for their first two attempts without the need for teacher approval.

If a student feels that he or she deserves a resubmission on a Lesson, Assignment, Quiz, or Test due to a technical issue such as a computer malfunction, the student should message his or her teacher to make the request. With Ember, the teacher may be a physical school teacher or the student's parent/guardian. The teacher can give another attempt from his or her Canvas account. For more information on how to do this, please review the Ember orientation course.

Schedule

Module 1: Measurement & Scientific Investigation

- Week 1: Scientific Method
- Week 2: Numbers and Measurements
- Week 3: Graphing
- Week 4: Volume and Density

Module 2: Force & Motion

- Week 5: Newton's Laws
- Week 6: Newton's 3rd Law
- Week 7: Forces that Move and Float
- Week 8: Centripetal Force
- Week 9: Quarter 1 Review and Exam

Module 3: Work & Power

- Week 10: Work & Power
- Week 11: Simple Machines, Part 1
- Week 12: Simple Machines, Part 2
- Week 13: Supporting Work

Module 4: Energy & Matter

- Week 14: Types of Energy
- Week 15: Conservation of Energy
- Week 16: Properties of Matter
- Week 17: Breaking It Down
- Week 18: Quarter 2 Review and Exam

Module 5: Electricity

- Week 19: The Shocking Truth About Electricity
- Week 20: Insulators and Conductors

Module 6: Magnets

- Week 21: Using Magnets
- Week 22: How Magnets are in Machines
- Week 23: Continuing with Magnets

Module 7: Light & Waves

- Week 24: Waves that Affect Us
- Week 25: The Parts of Light
- Week 26: How Sound is Used
- Week 27: Quarter 3 Review and Exam

Module 8: Nuclear & Atomic Theory

- Week 28: Atoms, Elements, and Compounds
- Week 29: The Periodic Table
- Week 30: More on the Periodic Table
- Week 31: How Atoms React
- Week 32: Finishing the Science Fair Project

Module 9: Chemical Reactions

- Week 33: Chemical Bonds
- Week 34: More Chemical Bonding
- Week 35: What is pH?
- Week 36: Quarter 4 Review and Exam