



Elementary Science Topics

Course Syllabus

Course Description

Elementary science education now emphasizes not just factual knowledge, but the ability to apply concepts to solve real-world problems. This course examines the core science content and best instructional practices aligned with the Next Generation Science Standards (NGSS). Topics include: Forces and Interactions, Ecosystems, Earth's Systems, Earth's Place in the Universe, Molecules to Organisms, Energy, Human Impact, and Engineering Design. Participants will explore hands-on strategies to help students think critically, collaborate effectively, and engage deeply with science.

This course enhances classroom teaching effectiveness and supports improved student outcomes by introducing new knowledge in core elementary science content aligned with NGSS, with research-based strategies and hands-on, inquiry-based learning to help young learners think critically and apply scientific concepts to real-world problems.

Course Objectives

At the end of this course you should be able to:

1. Explain key concepts of forces and interactions and design an age-appropriate lesson for elementary students.
2. Describe essential ecosystem principles and create a teaching activity that supports elementary student understanding.
3. Summarize core ideas of Earth's systems and develop a classroom strategy for effectively teaching them.
4. Identify major concepts about Earth's place in the universe and plan an instructional approach suitable for elementary learners.
5. Explain the structures and processes of organisms and outline a lesson that supports elementary student engagement with these ideas.
6. Describe foundational energy concepts and construct a learning experience that promotes inquiry in the elementary classroom.
7. Analyze the effects of human activity on Earth and propose a student-centered project to build awareness among elementary students.
8. Define the components of engineering design and design a hands-on learning task that applies these principles in an elementary context.



Modules

- Module 1: Forces and Interactions, Quiz 1
- Module 2: Ecosystems, Quiz 2
- Module 3: Earth's Systems, Quiz 3
- Module 4: Earth's Place in the Universe, Quiz 4
- Module 5: From Molecules to Organisms, Quiz 5
- Module 6: Energy, Quiz 6
- Module 7: Human Impacts on Earth, Quiz 7
- Module 8: Engineering Design, Quiz 8

Grading

Each quiz must be passed at an 80% or higher (three attempts allowed).

Format

This is a self-paced, asynchronous (no required live meetings) course. Throughout the PD course, you will find it helpful to take notes along the way to assist with the quizzes. Within each module, you will find reflection assessments that are not graded but will help in your journey through the course. There is an interactive forum in the course to help you connect with peers and instructors, share ideas, and collaborate on best practices throughout your learning journey.