

Science 8 (4840) Course Overview Curriculum Document

Course Description

This class is an inquiry-based science course that focuses on four major themes in science: The Diversity and Unity of Life, Space Systems, Forces and Motion and Waves and Information Transfer. These themes are explored through the lens of naturally occurring phenomena. This course is built on an instructional philosophy that centers on building scientific skills and habits that are practiced by scientists and engineers. Each standard is broken down into key scientific skills (Science and Engineering Practices), overarching concepts (Cross Cutting Concepts) and important content knowledge (Disciplinary Core Ideas) that help students gain a thorough understanding of the scientific process.

Credits

N/A

Prerequisites

Seventh Grade Science

Board Approved

June 2003

Revised

May 2019, June 2022

Required Assessments

District-wide, standards-based common summative assessments

Textbooks/Resources

STEMScopes. (2018). NGSS 3D STEMscopedia – Eighth. Rice University: Houston, TX.
ISBN: 978-1-64305-876-4

Course Essential Understandings

As a result of successfully completing this course, students will understand that:

- Structural changes to DNA can influence traits in populations of organisms, creating diversity
- Scaled models are used to compare the sizes and distances between objects in the universe
- Forces influence the motion of objects
- Waves transfer energy, which allows for organisms to communicate with each other.

Course Relevance Questions

What is our place in the universe?

Unit Overviews

Unit Name	Unit Description	Unit Relevance Question	Instructional Standards	Assessed Standards
Unit #1 The Diversity and Unity of Life	In this unit, students will develop models to identify how structural changes to DNA can influence traits in populations of organisms, creating diversity. Genetic diversity and environmental changes are factors that influence natural selection. Using this understanding, humans have further impacted the inheritance of traits through artificial selection. Rocks and fossils provide evidence of changes in organisms and environments on Earth.	What contributes to the diversity of life on Earth? How have living organisms on Earth changed over time?	MS-LS3-1 , MS-LS4-4 & MS-LS4-6 , MS-LS4-5 , MS-LS4-2 & MS-LS4-3 , MS-LS4-1 & MS-ESS1-4 , MS-ESS3-4	MS-LS3-1 , MS-LS4-4 & MS-LS4-6 , MS-LS4-5 , MS-LS4-2 & MS-LS4-3 , MS-LS4-1 & MS-ESS1-4 , MS-ESS3-4
Unit #2 Space Systems	In this unit, students will analyze and interpret quantitative characteristics of various space systems to gain an understanding of their scaled size and distance. These characteristics, when combined with the qualitative properties of individual objects, will help students develop a more complete model of our universe. Students will also investigate the many non-contact forces that govern the interactions of matter in the universe.	How do scientists determine the sizes and properties of objects in the universe? How do objects that are not in contact influence one another?	MS-ESS1-3 , MS-ESS1-1 , MS-ESS1-2 & MS-PS2-4 , MS-PS2-3 & MS-PS2-5	MS-ESS1-3 , MS-ESS1-1 , MS-ESS1-2 & MS-PS2-4 , MS-PS2-3 & MS-PS2-5
Unit #3 Forces and Motion	In this unit, students will plan investigations in order to explore Newton's laws of motion and develop an understanding of potential and kinetic energy. Students will apply this knowledge to construct and interpret graphs to help determine the relationships between mass, energy and motion of objects.	How do objects move? How is energy transferred in the world around us?	MS-PS2-1 & MS-PS2-2 , MS-PS3-1 & MS-PS3-2 , MS-ETS1-1	MS-PS2-1 & MS-PS2-2 , MS-PS3-1 & MS-PS3-2 ,
Unit #4 Waves and Information Transfer	In this unit, students will use models and mathematical representations to learn about and describe the basic properties of waves and their movement. With this information, students will identify the similarities and differences between digital and analog signals and learn how waves are used to transmit and help store information.	How do we communicate? How do we store and send information?	MS-PS4-1 & MS-PS4-2 , MS-PS4-3 , MS-ESS3-4 , MS-ETS1-2 ; MS-ETS1-4 ,	MS-PS4-1 , MS-PS4-2 & MS-PS4-3