



Course Name: Science

Grade: 8

Course Description:

The Grade 8 science course provides students with a rigorous, inquiry-based exploration of physical, life, and Earth sciences, designed to deepen their understanding of key scientific concepts and practices. Utilizing the OpenSciEd units, students investigate forces and motion, sound and waves, Earth's changing surface, human body systems, and engineering design through real-world phenomena and problem-solving challenges.

Throughout the year, students engage in hands-on investigations, develop and use scientific models, analyze data, and construct evidence-based explanations. The course emphasizes critical thinking, scientific communication, and the application of science and engineering principles to address complex questions and challenges.

Students explore Newtonian mechanics by studying contact and distance forces, delve into wave behavior through sound studies, and examine the dynamic processes shaping Earth's surface. They also investigate the structure and function of human body systems and apply engineering design processes to develop solutions to practical problems.

By fostering a deep understanding of disciplinary core ideas, crosscutting concepts, and science and engineering practices, this course prepares students for success in high school science and cultivates a lifelong curiosity about the natural world.

Course Proficiencies: The following is a list of proficiencies that describe what students are expected to know and be able to do as a result of successfully completing this course. The proficiencies are the basis of the assessment of student achievement. The learner will demonstrate the ability to:

1. Students apply Newton's laws to analyze and predict the motion of objects and the forces acting upon them (NJSLs: *MS-PS2-1, MS-PS2-2*).
2. Students explain the relationship between kinetic energy and total energy in systems involving motion and forces (NJSLs: *MS-PS3-1*).
3. Students construct explanations for electric and magnetic forces and how fields mediate interactions at a distance (NJSLs: *MS-PS2-4, MS-PS2-5*).
4. Students describe wave properties, including sound waves, and model how waves transmit energy through different media (NJSLs: *MS-PS4-1, MS-PS4-2, MS-PS4-3*).
5. Students analyze and model Earth's surface changes and natural hazards to inform risk reduction and mitigation strategies (NJSLs: *MS-ESS3-2, MS-ESS3-5*).
6. Students investigate and explain how human body systems interact to maintain health and respond to environmental factors (NJSLs: *MS-LS1-3, MS-LS1-8*).
7. Students use evidence to describe how matter and energy flow through organisms and ecosystems, including food utilization (NJSLs: *MS-LS1-7, MS-LS1-8*).
8. Students apply engineering design processes to develop, test, and improve solutions for practical problems and challenges (NJSLs: *MS-ETS1-1, MS-ETS1-2*).

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9. Students construct scientific arguments supported by evidence related to genetics, heredity, and natural selection (NJSLS: *MS-LS3-1*, *MS-LS4-1*, *MS-LS4-2*).
10. Students communicate scientific explanations and arguments effectively using models, data, and evidence across scientific disciplines.

Assessments:

1. Inquiry-based investigations and projects
2. Performance tasks
3. Student Models
4. Tests/quizzes
5. Scientific reading, writing, and mathematical analysis
6. Teacher observations
7. Classroom discussion
8. Participation in general classroom assignments

Board Adopted Materials:

Open Sci Edu