

**8th Grade Standards**

**Science**

**Course Overview:** Science 8 is an integrated science course that will study important ideas and principles from Life Science, Earth Science, and Physical Science. The course is intended to be a continuation of the Science 7 and Science 6.

**Middle School Science Essential Questions (Essential standards are the standards all students will learn as they complete the course.)**

* Students can identify systems and organs of the human body.
* Students appreciate the function of the systems and organs of the human body.
* Students understand how the human body changes throughout its life.
* Students know major disorders that effect major systems and organs of the human body.
* Students will understand that their choices affect the world around them.

**Unit 1: What is Science? (6 days)**

**Description:** Unit 1 will review basic laboratory safety procedures, equipment, how to use the lab equipment to students, and the scientific method. Students will also review how to work with the metric system, its prefixes, base units, and conversions. Finally students will be introduced to various branches of science and possible careers in those fields.

**Standards**

1. The students will know what Science is and understand its four branches and what is studied in each of them.
2. The students will identify and understand the format of the metric system. Including base units, prefixes, and the process of converting from one unit to another.
3. The students will understand the steps of the scientific method will be able to apply it when solving a problem

**Unit 2: Humans and Heredity (15 days)**

**Description:** Unit 2 will study the importance of heredity, its history, terminology, and current applications. The human body will be explored and its anatomy and physiology will be highlighted.

**Standards**

1. The students will understand basic principles and terminology of genetics. (MS-LS3-1, MS-LS3-2, MS-LS4-5)
2. The students will investigate how traits are impacted by our environment. (MS-LS3-2, MS-LS4-4)
3. The students will explore how organisms have changed over time. (MS-LS4-1, MS-LS4-2, MS-LS4-3, MS-LS4-4, MS-LS4-6)
4. The students will investigate the human body and its composition. (MS-LS1-1, MS-LS1-2, MS-LS1-3)
5. The students will explore the major systems of the human body and its components. (MS-LS1-3, MS-LS1-7, MS-LS1-8)

**Unit 3: Ecology (15 days)**

**Description:** Unit 3 will introduce basic principles of ecology to students. Students will study how our world is ecologically balanced and the value of living and non-living things in its ecosystems.

**Standards**

1. The students will study the interactions of organisms and investigate the role of competition within communities. (MS-LS2-1, MS-LS2-2, MS-LS2-5)
2. The students will explore major biological communities and investigate the biotic and abiotic factors associated with them. (MS-LS2-3, MS-LS2-5)
3. The students will explore the cycles found in nature and their importance and understand how energy flows throughout the environment. (MS-LS1-6, MS-LS2-3, MS-ESS3-3, MS-ESS3-4, MS-ESS3-5)
4. The students will understand the makeup of ecosystems and research how humans have impacted them over time. (MS-LS2-3, MS-LS2-4, MS-ESS3-3, MS-ESS3-4, MS-ESS3-5)

**Unit 4: Earth’s Changes over Time (15 days)**

**Description:** Unit 4 will study how our world has changed over time. The format and key events of geologic time will be discussed. Also, processes that have occurred today and have happened throughout time will be highlighted.

**Standards**

1. The students will understand continental drift and its impact on Earth and investigate the connection of seafloor spreading with it. (MS-ESS2-1, MS-ESS3-1)
2. The students will investigate the theory of Plate Tectonics and its connection with earthquakes, volcanoes, mountain building, etc. (MS-ESS2-1, MS-ESS2-2, MS-ESS3-2)
3. The students will explore the cause and characteristics of earthquakes, volcanoes, and mountains. (MS-ESS2-2, MS-ESS3-1)
4. The students will understand how fossils form, their different types, and how they can be used to find dates of Earth through relative and absolute aging. (MS-ESS1-4)
5. The students will study the eras, periods, and epochs of geologic time and how Earth has changed throughout each of these segments. (MS-ESS1-4, MS-ESS3-5)

**Unit 5: Earth’s Place in the Universe (15 days)**

**Description:** Unit 5 will study Astronomy. Students will explore Earth’s place in our solar system and our universe. Characteristics of planets and stars will also be learned as well as the history of human space travel.

**Standards**

1. The students will study the composition of Earth and its layers. (MS-ESS3-1)
2. The students will understand the impact of Earth’s tilt, rotation, and revolution. (MS-ESS1-1)
3. The students will investigate the characteristics of the moon and its exploration. (MS-ESS1-2)
4. The students will understand the makeup of our solar system, including the planets, moons, asteroids, comets, etc. (MS-ESS1-2, MS-ESS1-3)
5. The students will study the characteristics and different types of stars, focusing on our star, the sun. (MS-ESS1-2, MS-ESS1-3)
6. The students will understand the life cycles of stars and galaxies. (MS-ESS1-1, MS-ESS1-2)

**Unit 6: Chemistry of Matter (15 days)**

**Description:** Unit 6 will be an introduction to basic chemistry. Students will learn about the smallest unit of matter, elements and their properties, and the formation and structure of compounds. The use of the periodic table will be highlighted as well.

**Standards**

1. The students will study the current and past models of the atom, including its current structural make up. (MS-PS1-1)
2. The students will explore the elements that make up the periodic table and understand the significance of the arrangement of the periodic table. (MS-PS1-2, MS-PS1-3, MS-PS1-4)
3. The students will investigate how the structures of atoms relate to bonding and explore the different types of chemical bonds. (MS-PS1-1, MS-PS1-4, MS-PS1-5, MS-PS1-6, MS-PS2-4)
4. The students will understand how to read and balance a chemical equation and study different types of chemical reactions. (MS-PS1-2, MS-PS1-3, MS-PS1)

**Unit 7: Motions, Forces, and Energy (15 days)**

**Description:** Unit 7 is an introduction to physics. Students will study concepts of speed and acceleration and they will also learn applications of Newton’s three laws of motion. Also, machines and the work they do will be discussed.

**Standards**

1. The students will understand how to describe and calculate motion, acceleration, power, work, and momentum. (MS-PS2-2)
2. The students understand the properties and application of Newton’s Laws of Motion. (MS-PS2-1, MS-PS2-2)
3. The students will appreciate the importance of simple and compound machines and how they are used. (MS-PS3-1, MS-PS3-2)
4. The students will understand the relationship between temperature and thermal energy and investigate the properties of heat. (MS-PS3-3, MS-PS3-5)

**Unit 8: Physical Interactions (15 days)**

**Description:** Unit 8 will study the physics based ideas of electricity and magnetism. Student will explore they scientifically work and how we can apply them to real world situations. The unit will conclude with a study of different types of waves and their properties.

**Standards**

1. The students understand electric charge and investigate the characteristics of electric currents and their circuits. (MS-PS2-3)
2. The students will study magnetism, its properties and the relationship between electricity and magnetism. (MS-PS2-3, MS-PS2-5)
3. The students will study the properties and characteristics of waves, including sound and light. (MS-PS4-1, MS-PS4-2, MS-PS4-3)