

 **Standards**

**Science 6**

**Course Overview:** Science 6 is a full year course that will introduce the students to important ideas of Life Science, Earth Science, and Physical Science. The course is intended to be a way for the students to gain introductory knowledge that will allow them to further understand science as a whole and prepare them for future science courses.

**Science Essential Questions:**

\* Students will use the scientific method to solve problems.

\* Students will design and complete experiments to solve specific problems.

\* Student will know how to form a conclusion from a set of data.

\* Students will understand that their choices affect the world around them.

**Unit 1:** Science Basics

**Description:** Students will gain an understanding of the basic lab procedures, equipment, and precautions that should be used in labs. Students will understand what the scientific method is and work with the metric system.

**Standards**

1. Students can use lab equipment correctly and safely use common lab equipment.
2. Students understand the importance of safety precautions in science labs.
3. Students understand and can use the steps of the scientific method in order to solve problems.
4. Students understand that the scientific method is a repeating process.
5. Students understand what the metric units are.
6. Students can convert between metric units using a reference sheet.
7. Students can create single-line graph from scientific data.

**NGS Standards:** Science and Engineering Practices

**Unit 2:** Atoms, Elements, and the Periodic Table

**Description:** 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. Students can describe the characteristics of matter.
2. Students can identify what makes up matter.
3. Students can identify the parts of an atom.
4. Students can compare the models that are used for atoms.
5. Students can identify the relationship between elements and the periodic table.
6. Students can explain the meaning of atomic mass and atomic number.
7. Students can identify what makes an isotope.
8. Students can contrast metals, metalloids, and nonmetals.
9. Students can identify the characteristics of a compound.
10. Students can compare and contrast different types of mixtures.

**NGS Standards: MS-PS1**

**Unit 3:** Motion, Forces and Energy

**Description:** 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. Students can define speed and acceleration.
2. Students can calculate distance, speed, and acceleration.
3. Students understand Newton’s Laws of Motion.
4. Students can describe how forces affect motion.
5. Students can define work.
6. Students can distinguish the different types of simple machines.
7. Students understand how machines make work easier.
8. Students understand what energy is and the different forms it takes.
9. Students can compare and contrast potential energy and kinetic energy.
10. Students can distinguish between temperature and heat.
11. Students can determine how chemical energy is transformed.

**NGS Standards: MS-PS2; MS-PS3**

**Unit 4:** Waves

**Description:** Students will study what waves are, their properties, and behavior. They will understand that waves transfer energy from place to place without transferring matter.

**Standards**

1. Students can explain the relationship between waves, energy, and matter.
2. Students can describe the difference between transverse waves ad compressional waves.
3. Students can describe the relationship between the frequency and wavelength of a wave.
4. Students understand why waves travel at different speeds.
5. Students can explain how waves can reflect from some surfaces.
6. Students can explain how waves change direction when they move from one material into another.
7. Students understand how waves are able to bend around barriers.

**NGS Standards: MS-PS4**

**Unit 5:** Rocks and Minerals

**Description:** Students will study rocks and minerals. They will be able to explain the 3 different rock types and the difference between a rock and a mineral.

**Standards**

1. Students can identify the difference between a rock and a mineral.
2. Students can describe the properties that are used to identify minerals.
3. Students can identify the 3 types of rocks.
4. Students can explain how extrusive and intrusive igneous rocks are different.
5. Students can describe how different types of sedimentary rocks form.
6. Students can describe the conditions needed for metamorphic rocks to form.
7. Students can explain how all rocks are linked by the rock cycle.

**NGS Standards: MS-ESS2-1; MS-ESS3-1**

**Unit 6:** Atmosphere and Erosion

**Description:** Student will study erosion and the effects it has on the earth.Students will study the atmosphere and understand that it is constantly in motion, continually bringing changes in weather**.**

**Standards**

1. Students can identify agents of erosion.
2. Students can describe the effects of erosion.
3. Students can explain the composition of the atmosphere.
4. Students can describe how energy causes water on the Earth to cycle.
5. Students can describe the formation of different kinds of clouds and precipitation.
6. Students can explain what causes wind.
7. Students can explain the ways that air masses and fronts form.
8. Students understand the causes of severe weather.
9. Students can explain how technology is used to monitor and predict weather.

**NGS Standards: MS-ESS2**

**Unit 7:** Space

**Description:** Student will study the solar system and NASA. Students will explore Earth’s place in our solar system and our universe. Characteristics of planets and stars will also be learned.

**Standards**

1. Students can explain the electromagnetic spectrum.
2. Students can identify the difference between refracting and reflecting telescopes.
3. Students can recognize the differences between optical and radio telescopes.
4. Students can explain the history of the race to the Moon.
5. Students can explain the benefits of the space shuttle.
6. Students can identify the usefulness of orbital space stations.
7. Students can explain Earth’s rotation and revolution.
8. Students can explain why Earth has seasons.
9. Students can model the relative positions of Earth, the Moon, and the Sun during different lunar phases.
10. Students can compare and contrast the planets and moons in the solar system.

**NGS Standards: MS-ESS1**

**Unit 8:** Cells and Animals

**Description:** Student will study animal and plant cells. They will also gain an understanding of the difference between a vertebrate and an invertebrate.

**Standards**

1. Students can identify parts of the animal and plant cell.
2. Students can explain the functions of different cell parts.
3. Students can differentiate between vertebrates and invertebrates.
4. Students can list the major characteristics common to all vertebrates.
5. Students can explain the difference between ectotherms and endotherms.
6. Students can identify the characteristics common to all mammals.

**NGS Standards: MS-LS1**

**Unit 9:** Human Body and Genetics

**Description:** Student will study the human body and the functions of it. They will also have an introduction into the study of genetics.

**Standards**

1. Students can explain how the skeletal and muscular systems provide structure and allow movement.
2. Students can identify the functions of the digestive, respiratory, and circulatory systems.
3. Students can distinguish between the nervous and endocrine system.
4. Students can identify the organs of the male and female reproductive system.
5. Students can describe the stages of development before birth.
6. Students can sequence the life stages of humans.
7. Students can describe how cells divide.
8. Students can compare and contrast sexual and asexual reproduction.
9. Students can describe the structure and function of DNA.
10. Students can explain how traits are inherited.
11. Students can relate chromosomes, genes, and DNA to one another.
12. Students can discuss how mutations add variation to a population.
13. Students can distinguish between dominant and recessive.

**NGS Standards: MS-LS3**

**Unit 10:** Basic Ecology

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

**Standards**

1. Students can describe the living and nonliving factors in an ecosystem.
2. Students can explain how the parts of an ecosystem interact.
3. Students can describe the how living things are organized into groups.
4. Students can explain how organisms get the energy they need.
5. Students can describe how energy flows through the ecosystem.
6. Students understand the importance of oceans.
7. Students can explain how waves are formed.
8. Students can distinguish between producers, consumers, and decomposers.
9. Students understand the food web and food chain.
10. Students understand the water cycle.

**NGS Standards: MS-LS2; MS-ESS3; MS-PS1**