

**SCIENCE Standards**

**9th Grade**

**Course Overview:** Science 9 is an introduction to Physical Science course. It will focus on the branches of Chemistry and Physics throughout the school year. A project that all students in Physical Science will complete is the Rubber Band Car. This course will lay the ground work for future upper level science classes.

**Unit 1: Energy and Motion (6-7 weeks)**

**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, uncertainty, and conversions. Students will then dig further into the basic understanding of Energy and Motion involved in their lives

 **Standards**

1. I will understand what is expected of me in this course. A.8.1
2. I will learn and understand the English and metric systems. A.8.1
3. I will be able to use the scientific method in my classes. C.8.1 – C.8.11
4. I will gain a better basic overall understanding of the methods of science in and outside the classroom. A.8.6
5. I will learn what is considered to be a standard of measurement. C.8.2
6. I will construct graphs that communicate my findings. C.8.9
7. I will be able to describe motion in everyday life. D.8.5
8. I will understand what it means when something accelerates. D.8.6
9. I will be able to relate motion to forces. D.8.6
10. I will be able to understand and use Newton’s Second Law. D.8.6
11. I will understand what it is meant by gravity. D.8.6
12. I will be able to understand and use Newton’s Third Law. D.8.6
13. I will be able to describe the nature of energy. E.8.1
14. I will understand that energy must be conserved and why. D.8.8
15. I will be able to define work and all of its aspects. D.8.9
16. I will be able to describe possible uses of machines. G.8.2
17. I will understand what simple machines do and why they are

advantageous. D.8.9

1. I will be able to compare temperature and heat. D.8.8
2. I will be able to explain how thermal energy is transferred. D.8.8
3. I will be able to describe the uses of heat. D.8.8

**Unit 2: Electricity and Energy Resources (4-5 weeks)**

**Description:** Unit 2 will introduce the concept of Electricity and the sources and uses of Electricity that are used every day. The students will be required to get a basic understanding of what happens when they flip on the light switch or turn the TV on instead of taking it for granted. This will give the students a realistic look at what is going on behind the scenes of the concept of Electricity.

 **Standards**

1. I will be able to understand where electric charge, current, and energy comes from. A.8.1
2. I will be able to define magnetism. D.8.4
3. I will be able to compare and contrast magnetism to electricity. D.8.4
4. I will understand how electric current is produced. D.8.4
5. I will be able to understand what fossil fuels are and which ones are renewable or not. E.8.6

**Unit 3: Energy on the Move (5-6 weeks)**

**Description:** Unit 3 will introduce the concept of waves in various forms from sound to light. The students will use lens and mirrors to further understand how light waves are reflected and or refracted. Also the real life application of waves will be discussed and the students will be able to comprehend why certain things such as radio communication works the way it does.

**Standards**

1. I will describe the wave properties and the nature of waves. D.8.8
2. I will be able to understand the nature and properties of sound while listening to music. D.8.8
3. I will be able to describe what electromagnetic waves along with the spectrum of waves include. D.8.8
4. I will interpret and understand the behavior of light including how it’s produced, its uses, and its possible colors. D.8.9
5. I will understand what the importance of mirrors and lenses are for such things as optical instruments. D.8.9

**Unit 4: The Nature of Matter (4-5 weeks)**

**Description:** Unit 4 contains the topics of what forms of matter are present on earth, how they are used or changed, along with the periodic table of elements. The Unit will take those topics and elaborate how the forms of matter were discovered along with how and when the elements were discovered and placed on the periodic table. At the end of the unit the students will get a small taste of radioactivity and nuclear reactions.

**Standards**

1. I will understand the composition of matter along with the properties of matter. D.8.1
2. I will understand how the kinetic theory relates to properties of fluids and behavior of gases. D.8.2
3. I will understand the structure of the atom. D.8.1
4. I will relate the masses of the atoms to that of the periodic table. D.8.1
5. I will understand how to detect radioactivity and how it relates to various forms of decay. D.8.1

**Unit 5: Diversity of Matter (3-4 weeks**)

**Description:** Unit 5 will take the basic discussions of the Periodic Table from the last Unit to further dive into how and what makes up the world we live in. The students will look into the Chemistry of what each element is and what and how they chemically combine or react with one another to create things that we use every day.

**Standards**

1. I will be able to describe the similarities and differences between metals and non-metals. D.8.1
2. I will understand how a bond creates stability. D.8.2
3. I will be able to write and interpret formulas and compounds. D.8.2
4. I will understand how chemical changes and the chemical equations interact.D.8.2
5. I will be able to explain and categorize chemical reactions. D.8.2

**Unit 6: Interactions of Matter (4-5 weeks)**

**Description:** Unit 6 will wrap up the last two Units discussing the chemical reactions with various compounds using acids, bases, and salts. This is a Unit to prepare the students to what they will be learning when they take Chemistry.

Standards

1. I will be able to explain how solutions form when referring to their stability and or concentration. D.8.1
2. I will understand how acids and bases have various strengths which are determined by varies properties. D.8.2
3. I will be able to distinguish between various organic compounds. D.8.2
4. I will be able to understand various uses of organic compounds such as petroleum. D.8.3
5. I will be able to understand how new findings such as polymers are important to life yet can be bad at the same time. D.8.3