7th Grade Science Curriculum Map

Month	Objectives/Learning Goals	Applicable State and National Learning Standards	Assessments
August	***Topic 1: Introduction to Matter*** How do scientists classify matter? Is it based on its physical properties? Measurable properties? Ability to change state or change form? Students learn that all of these concepts apply when identifying matter. They are important to know so that proper materials are combined (or not combined). They also lead to advancements in technology**.** **Lesson 1: Describing and Classifying Matter** Students compare the physical and chemical properties of matter and model the arrangement of atoms. They also compare homogeneous and heterogeneous mixtures**.** **Lesson 2: Measuring Matter** Students measure weight, mass, volume, and density as physical properties of matter. They also investigate how measurement can determine properties of matter. **Lesson 3: Changes in Matter** Students investigate how atoms are arranged during a chemical change. They also use text to support the idea that energy and matter are related.		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.
September	***Topic 2: Solids, Liquids, and Gases*** In this topic, students examine solids, liquids, and gases based on their physical properties. This includes their reactions to temperature changes, and their relationship to pressure and volume at the particle level**.**		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to analyze different scenarios

	Lesson 1: States of Mtter Students analyze and develop models to explain how particle arrangement and behavior define each of the three states of matter. Lesson **2: Changes of State** Students use scientific reasoning to determine the effects of thermal energy and pressure on matter at the particle level. **Lesson 3: Gas Behavior** Students examine the relationship between temperature, pressure, and volume as they apply to particle behavior of gases.***Topic 3: Energy*** With this topic, students learn the nature and role of energy in the world and apply concepts related to kinetic and potential energy to demonstrate how energy is transferred and transformed. Students use this information to trace energy through systems, understand where energy comes from and how and why energy is used, and make informed decisions about the use of energy to accomplish a specific task. **Lesson 1: Energy, Motion, Force, and Work** Students use text evidence and mathematical models to define energy, motion, force, and work and to determine their relatedness.		that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.
October	**Topic 3 Energy Continued. Lesson 2: Kinetic Energy and Potential Energy** Students model the relationship between kinetic and potential energy.**Lesson 3: Other Forms of Energy** Students use scientific evidence to identify and relate different forms of energy. **Lesson 4: Energy Change and Conservation**		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the

	Students model proportional relationships to explain that energy is neither created nor destroyed.		topic will have a comprehensive assessment covering all of the lessons in the topic.
November	***Topic 4: Thermal Energy*** Thermal energy and heat transfer are important concepts in many real-world situations, such as melting metals for industrial use, cooking and baking, and fashioning outerwear for specific purposes. While investigating energy transformations**,** students analyze the relationships among thermal energy, temperature, transfer of heat energy, and changes in states of matter. **Lesson 1: Thermal Energy, Heat, and Temperature** Students investigate the relationship between temperature, thermal energy, and heat. **Lesson 2: Heat Transfer** Students model various methods of heat transfer and describe what happens to energy during transformations.**Lesson 3: Heat and Materials** *Students investigate and describe how different materials respond to heat.* ***Topic 5: Waves and Electromagnetic Radiation*** Students explore and examine the different properties of these waves and the way that the waves interact with matter and with each other. Through this study, they also learn the ways in which electromagnetic waves are particularly relevant to our lives and to the		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.

	technologies that we use every day.**Lesson 1: Wave Properties** Students examine and model different properties of waves. They compare the properties of different types of waves and compare how different types of waves transfer energy.		
December	***Topic 5: Waves and Electromagnetic Radiation Continued*** Students explore and examine the different properties of these waves and the way that the waves interact with matter and with each other. Through this study, they also learn the ways in which electromagnetic waves are particularly relevant to our lives and to the technologies that we use every day. **Lesson 2: Wave Interactions** Students investigate the ways that waves can react when they strike materials and the effects of interactions between waves. **Lesson 3: Sound Waves** Students investigate how sound waves interact with matter through reflection, absorption, transmittal, and diffraction and how properties of materials affect the speed of sound. **Lesson 4: Electromagnetic Waves** Students learn about the different types of electromagnetic waves, how they compare, and how they are used. **Lesson 5: Light** Students model light-matter interactions to determine how transparent, translucent, opaque, and colored materials reflect and absorb light. Students also model how light interacts with concave and convex lenses.orption, transmittal, and diffraction		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.

	and how properties of materials affect the speed of sound.		
January	***Topic 6: Forces and Motion*** Every experience in everyday life is a study in force and motion. Just sitting and reading this text provides a scene to develop concepts such as friction, gravity, and balanced forces and unbalanced forces. In this topic, students learn about motion; various forces that cause motion; related concepts such as speed, velocity, and acceleration; Newton's three laws of motion; and friction and gravitational forces all within the context of everyday (and not-so-everyday) experiences.**Lesson 1: Describing Motion and Force**. Students analyze evidence from the world around them to define motion, and they identify and describe forces and motion. **Lesson 2: Speed, Velocity, and Acceleration** Students use mathematical and computational thinking to apply formulas for determining and graphing speed and acceleration. **Lesson 3: Newton's Laws of Motion** Students develop and use models to demonstrate each of Newton's three laws of motion. **Lesson 4: Friction and Gravitational Interactions** Students use evidence to construct explanations related to contact and noncontact forces.		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.
February	Science Fair Project Mouse Trap Car. That will require them to recall Force and motion, energy transfers as well as learn about simple machines.		Worksheets and digital Interactivities that allow students to learn about the

			lesson. Hands on labs, virtual labs that allow students to analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.
March	***Topic 7 : Atoms and the Periodic Table*** The structure of atoms and the periodic table are important concepts that will be used in future investigations to help understand the properties of elements. While investigating this topic, students will make important connections between chemistry and the real world. **Lesson 1: Atomic Theory** Students investigate the development of atomic theory as well as the components of an atom.**Lesson 2: The Periodic Table** Students explore how the periodic table can be used to describe important properties of elements. **Lesson 3: Bonding and the Periodic Table** Students recognize that there are a finite number of elements and that their atoms combine in a multitude of ways to produce compounds that make up all living and nonliving things. The law of conservation of matter and how compounds combine will be investigated through balancing chemical equations.		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.
April/May	***Topic 7 Continued : Atoms and the Periodic Table*** The structure of atoms and the periodic table are important concepts that will be used in future investigations to help understand the properties of elements. While investigating this		Worksheets and digital Interactivities that allow students to learn about the lesson. Hands on labs, virtual labs that allow students to

	topic, students will make important connections between chemistry and the real world. **Lesson 4: Types of Bonds** Students examine the various types of compounds that can form and examine how they differ in their composition **Lesson 5: Acids and Bases** Students describe the properties of acids and bases.		analyze different scenarios that are presented in the lessons. Each lesson will culminate in a quiz, and the topic will have a comprehensive assessment covering all of the lessons in the topic.
		PS-MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. PS-MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. PS-MS-PS1-5 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. MS-PS1-A-2 Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-3) MS-PS1-B-1 Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are	

		regrouped into different molecules, and these new substances have different properties from those of the reactants. (MS-PS1-3) MS-SEP-2.e Develop and/or use a model to describe phenomena. MS-SEP-3.a Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. MGS-SEP-7.c Construct use, and present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. 6-8-CCC-1.a Macroscopic patterns are related to the nature of microscopic and atomic-level structure. MGS-NoS-2.a Science knowledge is based upon logical and conceptual connections between evidence and explanations. MGS-NoS-4.c Laws are regularities or mathematical descriptions of natural phenomena. STSE-MS-	

		2.b The uses of technologies and any limitation on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. MS-SEP-3.a Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. MS-SEP-3.b Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of the investigation. MS-SEP-4.a Construct and interpret graphical displays of data and/or large data sets to identify linear and nonlinear relationships. MS-SEP-4.g Analyze and interpret data to determine similarities and differences in findings. 6-8-CCC-2.b Cause and effect relationships may be used to predict phenomena in natural systems. 6-8-CCC-3.a Time, space, and energy phenomena can be observed at various scales using	

		models to study systems that are too large or too small. 6-8-CCC-4.b Models can be used to represent systems and their interactions. 6-8-CCC-6.b Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. PS-MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures. PS-MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. MS-PS1-A-1 Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (MS-PS1-1) MS-PS1-A-2 Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-3) MS-PS1-A-5 Solids may be formed from molecules, or they may be	

		extended structures with repeating subunits (e.g., crystals). (MS-PS1-1) MS-SEP-2.e Develop and/or use a model to describe phenomena. MS-SEP-2.f Develop a model to describe unobservable mechanisms. MS-SEP-3.a Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. MGS-NoS-2.a Science knowledge is based upon logical and conceptual connections between evidence and explanations.	