

Unit 1: Physical Science: Structure, Properties and Interaction of Matter (3rd Marking Period; Approximately First 4 Weeks)

Report card standard:

- Explain the structures, properties, and interactions of matter

Big Idea	Essential Questions	Concepts	Competencies	Vocabulary
Matter can be understood in terms of the types of atoms present and the interaction both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	When two or more different substances are mixed, a new substance with different properties may be formed.	Plan and conduct an investigation to determine whether the mixing of two or more substances results in new substances (ex: cooking, baking, burning, etc.)	Chemical Change Physical Change Mass Temperature Volume
		Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means.	Develop a model to describe that matter is made of particles too small to be seen.	Condensation Evaporation Matter Particles
		Measurements of a variety of properties can be used to identify materials.	Make observations and measurements to identify given materials based on their properties.	Hardness Mass Moh's Scale Porosity Properties Solubility Streak Test Volume
		The amount of matter is conserved when it changes form.	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total mass of matter is conserved.	Conservation of Mass
		When two or more different substances are mixed, a new substance with different properties may be formed: such occurrences depend on the substance and the temperature.	Investigate the interaction of two or more substances to provide evidence that when different substances are mixed, one or more new substances with different properties may or may not be formed.	Chemical Change Mixtures Compounds

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		No matter what reaction or change in properties occurs, the total mass of the substance does not change.	Plan and carry out investigations to determine the effect on the total mass of a substance when the substance changes shape, phase, and/or is dissolved.	Chemical Change Dissolve Physical Changes
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How can one explain and predict interactions between objects within systems?	**Gravitational force of Earth acting on another object near Earth's surface pulls that object toward the planet's center. **Earth and Space Science	**Construct and support an argument that the gravitational force exerted by Earth on objects is directed down. **Earth and Space Science	Gravitational Force
	How is energy transferred and conserved?	**Energy released from food was once energy from the sun that was captured by plant in the chemical process that forms plant matter. **Life Science	**Use a model to describe that energy in animal's food was once energy from the sun. **Life Science	Energy Flow Flow Chart Model Photosynthesis

Unit 2: Life Science: Ecosystems (3rd Marking Period; Approximately Last 5 Weeks)

Report card standard

- Describe how organisms live, grow, and interact with their environment.

Big Idea	Essential Questions	Concepts	Competencies	Vocabulary
All organisms are made of cells and can be characterised by common aspects of their structure and function.	How do organisms live, grow, respond to the environment, and reproduce?	Food provides animals with materials needed for body repair and growth.	Use a model to describe that energy in animal's food was once energy from the sun.	Food Chain Food Web
		Food provides animals with materials needed for energy and to maintain body warmth and for motion.		
		Plants acquire their materials for growth primarily from air and water.	Using evidence, present and argument that plants get the materials they need for growth primarily from air and water.	Argument Evidence Minerals
		Animals and plants alike take in gases and water and release waste/matter into the environment: animals must take in food, and plants need light and minerals.	Construct and communicate models of food webs that demonstrate the transfer of matter and energy among organisms within an ecosystem	Ecosystems Food Webs
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	Organisms can survive only in environments in which their particular needs are met.	Ask researchable questions about the ways organisms obtain matter and energy across multiple and varied ecosystems.	Researchable Species Web of Life
		A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.	Construct a model of a food web to demonstrate the transfer of matter and energy among organisms within an ecosystem.	Ecosystem Transfer Energy
		Newly introduced species can damage the balance of an ecosystem.	Identify a newly introduced species to an ecosystem and provide evidence that it is an invasive species or noninvasive species.	Ecosystem Invasive Noninvasive Species System

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		Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.	Use models to trace the cycling of particles of matter between the air and soil and among plants, animals, and microbes.	Cycles Matter Microbes
			Use models to describe how decomposition eventually restores/recycles some materials back to the soil for plants to use.	Decomposers Decomposition Microbes
		A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.	Describe a healthy ecosystem as a system in terms of the components and interactions.	Ecosystem Components System System Models

Unit 3: Earth and Space Science (4th marking period)

Report card standard

- Explain the interactions of the Earth, moon, and stars.
- Explain how and why Earth is constantly changing.

Big Idea	Essential Question	Concepts	Competencies	Vocabulary
The universe is composed of a variety of different objects, which are organized into systems each of which develops according to accepted physical properties and laws.	What is the universe, and what is Earth's place in it?	The sun is a star that appears larger and brighter than other stars because it is closer.	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth.	Relative distance Stars Sun
		Stars range greatly in their distance from Earth.	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth.	Apparent brightness Earth Relative distance Stars Sun
		The orbits of Earth around the sun and of the moon around Earth, together with rotation of Earth about an axis between its North and South poles, cause observable patterns. (ex. day and night, length and direction of shadows, different positions of sun, moon, and stars)	Represent data in graphical displays to reveal patterns of daily changes in the length and direction of shadows, day and night, and seasonal appearance of stars in the sky.	Data Graphical display Patterns Representation Shadows
The Earth is a complex and dynamic set of interconnected systems (geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and the Earth's interior. These flows and cycles produce chemical and physical changes in Earth's materials and living organisms.	Construct and analyze models to describe systems interactions among the geosphere, hydrosphere, atmosphere, and biosphere.	Atmosphere Biosphere Chemical change Energy flow Geosphere Hydrosphere Model Physical change

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			Through the creation of a model, explain that the chemical and physical processes that cycle earth materials and from rocks.	
		Earth's major systems are the geosphere, hydrosphere, and biosphere, which interact in multiple ways to affect the Earth's surface materials and processes.	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. This could include the influence of atmosphere on landforms and ecosystems through weather and climate, mountain ranges on winds and clouds, etc.	
		The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate.	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact.	
		Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.	Utilizing observations and data, explain the patterns of weather in a given location.	Weather
		Most fresh water is in glaciers or underground with the remainder in streams, lakes, wetlands, and atmosphere.	Using real time data, graph amounts of water in various reservoirs to provide evidence about the distribution of water on Earth.	Distribution
		Water continually cycles among land, ocean, and atmosphere via transportation, evaporation, condensation and crystallization, and precipitation as well as downhill flows on land.	Investigate movement in the Earth's systems and research and develop models for the cycling of water.	Atmosphere Precipitation Transpiration Water cycle Water system
The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Human activities in agriculture, industry, and everyday life have had major effects on land, vegetation, streams, ocean, and air.	Research and communicate how communities are using science to protect resources and environments.	Atmosphere Human impact Research Resources

