

Grade 5 - Science Curriculum Framework

(NGSS in Parentheses)

Physical Science								
Grade	Big Idea	Essential Questions	Concepts	Competencies	Vocabulary	2002 Standards	SAS Standards	Assessment Anchor Eligible Content
5	Matter can be understood in terms of the types of atoms present and the interactions 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. (PS1.B)	Plan and conduct an investigation to determine whether the mixing of two or more substances results in new substances (e.g., cooking, baking, burning, etc.). (5-PS1-4)	Chemical change vs. physical change Mass Temperature Volume	3.4.7.A 3.2.7.B	3.2.5.A6 3.2.3 A.4	S8.C.1.1.3 S8.A.1.3 S8.A.2.2 S8.A.2.1
5	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	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. (PS1.A)	Develop a model to describe that matter is made of particles too small to be seen. (5-PS1-1)	Condensation Evaporation Matter Particles	3.4.7.A 3.1.7.B 3.2.7.B	3.2.5.A6	S8.C.1.1.2 S8.A.1.3 S8.A.2.2 S8.A.2.1
5	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Measurements of a variety of properties can be used to identify materials. (PS1.A)	Make observations and measurements to identify given materials based on their properties. ((5-PS1-3)	Hardness Mass Moh's scale Porosity Properties Solubility Streak tests Volume	3.4.7.A 3.1.7.C 3.2.7.B	3.2.5.A6	S8.C.1.1.2 S8.A.1.3 S8.A.2.2 S8.A.2.1
5	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	The amount of matter is conserved when it changes form. (PS1.A)	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. (5-PS1-2)	Conservation of mass	3.4.7.A 3.1.7.B 3.2.7.B	3.2.5.A6	S8.C.1.1.3 S8.A.1.3 S8.A.2.2 S8.A.2.1

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5	Matter can be understood in terms of the types of atoms present and the interactions 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; such occurrences depend on the substances and the temperature. (PS1.B)	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. (5-PS1-4)	Chemical change Mixtures vs. compounds	3.4.7.A	3.2.6.A4 3.2.7.A4	S8.C.1.1.1 S8.A.1.3 S8.A.2.2 S8.A.2.1 S8.C.1.1.2 S8.C.1.1.3
5	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	No matter what reaction or change in properties occurs, the total mass of the substances does not change. (PS1.B)	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. (5-PS1-2)	Chemical change Dissolve Physical changes	3.4.7.A 3.1.7.C 3.2.7.B	3.2.5.A6	S8.C.1.1.3 S8.A.1.3 S8.A.2.2 S8.A.2.1
5	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. (PS2.B) *Earth and Space Science	*Construct and support an argument that the gravitational force exerted by Earth on objects is directed down. (5-PS2-1) *Earth and Space Science	Gravitational force	3.4.7.C 3.4.7.D	3.3.6B1 3.3.7.B1	S8.C.3.1 S8.D.3.1 S8.D.3.1.1 S8.D.3.1.2
5	Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	**Energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter. (PS3.D) **Life Science	**Use a model to describe that energy in animal's food was once energy from the sun. (5-PS3-1) **Life Science	Energy flow Flow chart Model Photosynthesis		4.1.7.C	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3 S8.C.2.1 S8.C.2.1.1 S8.C.2.2.1
5	Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of	How are waves used to transfer energy and information?	N/A	N/A	N/A	N/A	N/A	N/A

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	matter.							
Life Science								
Grade	Big Idea	Essential Questions	Concepts	Competencies	Vocabulary	2002 Standards	SAS Standards	Assessment Anchor Eligible Content
5	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Food provides animals with materials needed for body repair and growth. (PS3.D)	Use a model to describe that energy in animal's food was once energy from the sun. (5-PS3-1)	Food chain Food web	3.3.7.A 3.2.7.B 3.1.7.A 3.1.7.C	3.1.7.A8	S8.B.3.1.1 S8.B.3.1.3 S8.A.3.2.1 S8.A.3.2.3
5	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Food provides animals with materials needed for energy and to maintain body warmth and for motion. (LS1.C)	Use a model to describe that energy in animal's food was once energy from the sun. (5-PS3-1)	Food chain Food web	3.3.7.A 3.2.7.B 3.1.7.A 3.1.7.C	3.1.7.A8	S8.B.3.1.1 S8.B.3.1.3 S8.A.3.2.1 S8.A.3.2.3
5	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Plants acquire their material for growth primarily from air and water. (LS1.C)	Using evidence, present an argument that plants get the materials they need for growth primarily from air and water. (5-PS3-1)	Argument Evidence Minerals	3.3.7.A 3.2.7.B 3.1.7.A 3.1.7.C	3.1.7.A8	S8.B.3.1.1 S8.B.3.1.3 S8.A.3.2.1 S8.A.3.2.3
5	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	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. (LS2.B)	Construct and communicate models of food webs that demonstrate the transfer of matter and energy among organisms within an ecosystem. (5-LS2-1)	Ecosystem Food webs	3.3.7.A 3.2.7.B 3.1.7.A 3.1.7.C	3.1.7.A8	S8.B.3.1.1 S8.B.3.1.3 S8.A.3.2.1 S8.A.3.2.3
5	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the	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. (LS2.A)	Ask researchable questions about the ways organisms obtain matter and energy across multiple and varied ecosystems. (5-LS2-1)	Researchable Species Web of life	3.3.7.A 3.2.7.B	3.1.6.A2	S8.B.3.1.1

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	physical environment.							
5	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?	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. (LS2.A)	Construct a model of a food web to demonstrate the transfer of matter and energy among organisms within an ecosystem. (5-LS2-1)	Ecosystem Transfer energy	3.3.7.A 3.2.7.B	3.1.6.A2	S8.B.3.1.1
5	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?	Newly introduced species can damage the balance of an ecosystem. (LS2.A)	Identify a newly introduced species to an ecosystem and provide evidence that it is an invasive species or noninvasive species. (5-LS2-1)	Ecosystem Invasive Noninvasive Species System	3.2.7.B 3.1.7.B	3.1.6.A2	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3
5	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?	Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. (LS2.B)	Use models to trace the cycling of particles of matter between the air and soil and among plants, animals, and microbes. (5-LS2-1)	Cycles Matter Microbes	3.3.7.C 3.2.7.B 3.1.7.B	3.1.6.A2	S8.B.3.1.1 S8.B.3.1.2
5	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?	Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. (LS2.B)	Use models to describe how decomposition eventually restores (recycles) some materials back to the soil for plants to use. (5-LS2-1)	Decomposers Decomposition Microbes	3.2.7.B 3.1.7.B	3.1.6.A2	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3

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5	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?	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. (LS2.A)	Describe a healthy ecosystem as a system in terms of the components and interactions. (5-LS2-1)	Ecosystem Components System models	3.2.7.B 3.1.7.B	3.1.6.A2	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3
5	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?	N/A	N/A	N/A	N/A	N/A	N/A
5	Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	N/A	N/A	N/A	N/A	N/A	N/A
Earth and Space Science								
Grade	Big Idea	Essential Questions	Concepts	Competencies	Vocabulary	2002 Standards	SAS Standards	Assessment Anchor Eligible Content
5	The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes 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. (ESS1.A)	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth. (5-ESS1-1)	Relative distance Stars Sun	3.3.8.B	3.3.8.B1	S8.D.3.1 S8.D.3.1.1 S8.D.3.1.3

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	The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Stars range greatly in their distance from Earth. (ESS1.A)	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth. (5-ESS1-1)	Apparent brightness Earth Relative distance Stars Sun	3.3.8.B	3.3.8.B1	S8.D.3.1 S8.D.3.1.1 S8.D.3.1.3
	The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	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 (e.g., day and night, length and direction of shadows, different positions of sun, moon, and stars). (ESS1.B)	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. (5-ESS1-2)	Data Graphical display Patterns Representation Shadows	3.3.8.B	3.3.5.B1	S8.D.3.1 S8.D.3.1.1 S8.D.3.1.3
5	The Earth is a complex and dynamic set of interconnected systems (e.g. 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.(ESS2.A)	Construct and analyze models to describe systems interactions among the geosphere, hydrosphere, atmosphere, and biosphere. ((5-ESS2-1)	Atmosphere Biosphere Chemical change Energy flow Geosphere Hydrosphere Model Physical change	3.4.7.B 3.4.7.A	3.3.4.A4 3.3.4.A5	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.d.1.1.1
5	The Earth is a complex and dynamic set of interconnected systems (e.g. 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	Through the creation of a model, explain that the chemical and physical processes that cycle earth materials and form rocks. (5-ESS2-1)	Atmosphere Biosphere Chemical change Energy flow Geosphere Hydrosphere Model Physical	3.4.7.B 3.4.7.A	3.3.4.A4 3.3.4.A5	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.d.1.1.1

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			materials and living organisms. (ESS2.A)		change			
5	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Earth's major systems are the geosphere, hydrosphere, and biosphere, which interact in multiple ways to affect the Earth's surface materials and processes. (ESS2.A)	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. This could include the influence of atmosphere on landforms and ecosystems though weather and climate, mountain ranges on winds and clouds, etc. (5-ESS2-1)	Atmosphere Biosphere Geosphere Hydrosphere	3.4.7.B 3.4.7.A	3.3.4.A4 3.3.4.A5	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.d.1.1.1
5	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. (ESS2.A)	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. (5-ESS2-1)	Atmosphere Biosphere Geosphere Hydrosphere	3.4.7.B 3.4.7.A	3.3.4.A4 3.3.4.A5	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.d.1.1.1
5	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (ESS2.A)	Utilizing observations and data, explain the patterns of weather in a given location. (5-ESS2-1)	Weather	3.5.7.C	3.3.5.A5 3.3.6.A5	S8.D.2.1 S8.D.2.1.1 S8.D.2.1.2 S8.D.2.1.3
5	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact	How and why is Earth constantly changing?	Most fresh water is in glaciers or underground with the remainder in streams, lakes, wetlands, and atmosphere. (ESS2.C)	Using real time data, graph amounts of water in various reservoirs to provide evidence about the distribution of water on earth. (5-ESS2-2)	Distribution	3.1.7.A 3.1.7.B 3.1.7.E 3.1.7.C 3.2.7.A 3.2.7.B	3.3.6.A4	S8.D.1.3 S8.D.1.3.4

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	over a wide range of temporal and spatial scales.					3.2.7.C 3.2.7.D		
5	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation as well as downhill flows on land.	Investigate movement of water in the Earth's systems and research and develop models for the cycling of water.	Atmosphere Precipitation Transpiration Water cycle Water system	3.5.7.D	3.3.5.A4 3.3.6.A4 3.3.8.A4	S8.A.1.1 S8.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.D.1.3.1
5	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. (ESS3.C)	Research and communicate how communities are using science to protect resources and environments. (5-ESS3-1)	Atmosphere Human impact Research Resources	3.5.7.B 3.8.7.B	4.3..10.A	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.D.1.1 S8.B.3.3 S8.C.2.2.3