

Grade 2 - Science Curriculum Framework

(NGSS in Parentheses)

Physical Science								
Grade	Big Idea	Essential Question	Concepts	Competencies	Vocabulary	2002 Standards	SAS Standards	Anchor Eligible Content
2	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?	Different kinds of matter exist in various states. (PS1.A)	Observe, describe, and classify matter by properties and uses (e.g., size, shape, weight, solid, liquid, gas). (2-PS1-1)	Classify Describe Gas Liquid Matter Patterns Solid Weight	3.4.4A	3.2.3.A1 3.2.4.A1 3.2.3.A2	S4.C.1.1.1 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
2	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 can be described and classified by its observable properties. (PS1.A)	Observe, describe, and classify matter by properties and uses (e.g., size, shape, weight, texture, flexibility, hardness, color, etc.). (2-PS1-1)	Color Flexibility Gas Liquid Matter Properties Solid Texture Weight	3.4.4A	3.2.3.A1 3.2.4.A1 3.2.3.A2 3.2.K.A.1	S4.C.1.1.1 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
2	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?	Different kinds of matter exist in various states, depending on temperature. (PS1.A)	Plan and carry out investigations to test the idea that warming some materials causes them to change from solid to liquid and cooling causes them to change from liquid to solid. (2-PS1-1)	Investigations Liquid Solid	3.4.4A	3.2.1.A.1 3.2.1.A.3 3.2.2.A.3 3.2.3.A.3.	S4.C.1.1.1 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
2	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 can be described and classified by its observable properties. (PS1.B)	Plan and carry out investigations to test the idea that warming some materials causes them to change from solid to liquid and cooling causes them to change from liquid to	Liquid Solid	3.4.4A	3.2.1.A.3 3.2.1.A.4 3.2.K.A.1	S4.1.1.2 S4.A.1.1 S4.1.3.1 S4.A.2.1.4

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				solid. (2PS1-4)				
2	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?	Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (PS1.B)	Construct an argument and provide evidence that some changes caused by heating or cooling can be reversed and some cannot. (2-PS1-4)	Argument Boiling Cause and effect Evidence Freezing Melting Reverse	3.4.4A	3.2.2.A.3 3.2.1.A.4	S4.C.1.1.1 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
2	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?	Different properties are suited for different purposes. (PS1.A)	Analyze data from testing objects made from different materials to determine if a proposed object functions as intended. (2-PS1-2)	Data Functions Test	3.4.4A		S4.C.1.1.2 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
2	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?	A great variety of objects can be built up from a small set of pieces. (PS1.A)	Design an object built from a small set of pieces to solve a problem and compare solutions designed by peers given the same set of pieces. (2-PS1-3)	Construct Design Engineer Problem solving Solutions	3.1.4 3.2.4C		S4.A.3.2.B S4.A.3.2 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
2	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?	A great variety of objects can be built up from a small set of pieces. (PS1.A)	Make observations of how an object made of small set of pieces can be disassembled and made into a new object. (2-PS1-3)	Construct Design Disassemble Engineer Problem solving Solutions	3.1.4 3.2.4C		S4.A.3.2.B S4.A.3.2 S4.A.1.1 S4.1.3.1 S4.A.2.1.4
2	Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	N/A	N/A	N/A	N/A	N/A	N/A
2	Interactions of objects or	How is energy transferred and	N/A	N/A	N/A	N/A	N/A	N/A

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	systems of objects can be predicted and explained using the concept of energy transfer and conservation.	conserved?						
2	Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	N/A	N/A	N/A	N/A	N/A	N/A
Life Science								
Grade	Big Idea	Essential Question	Concepts	Competencies	Vocabulary	2002 Standards	SAS Standards	Anchor Eligible Content
2	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?	N/A	N/A	N/A	N/A	N/A	N/A
2	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?	Animals can move around, but plants cannot, and they often depend on animals for pollination or seed dispersal. (LS2.A)	Develop a model to demonstrate different modes of seed dispersal. Plan and investigate effectiveness of different types of seed dispersal. (2-LS2-2)	Pollination Seed dispersal	3.3.4A	3.1.4.A 3.1.4.B 3.1.4.C 4.1.4.A 4.5.4.D 4.2.4.C	S4.B.1.1.1 S4.B.1.1.5 S4.B.2.1.1
2	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other	How and why do organisms interact with their environment and what are the effects of these interactions?	Different plants survive better in different settings because they have varied needs for water, minerals, and sunlight. (LS2.A)	Plan and carry out investigations to test whether plants from different settings have different needs for water, sunlight, and type of soil. (2-LS2-1)	Soil Sunlight Minerals Water	3.3.4A	3.1.4.A.2 3.1.4.B.5 3.1.4.C.1 4.1.4.A 4.5.4.D 4.2.4.C	S4.B.2.1.1 S4.B.2.1.2

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	organisms and the physical environment.						3.1.5.C.1	
2	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 obtain the materials they need to grow and survive from their environment. (LS2.A)	Obtain, evaluate, and communicate information that in any particular environment, some kinds of organisms survive well and some do not. (2-LS2-2)	Environment Survive	4.6.4A	3.1.4.A.2 3.1.4.C.1 4.5.4.D. 4.2.4.C 3.1.5.C.1	S4.B.2.1.1 S4.B.2.1.2
2	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?	Plants depend on water and light to grow. LS2.A)	Plan and conduct an investigation to determine if plants need sunlight and water to grow. (2-LS2-2)	Minerals Soil Sunlight Water	3.3.4A	3.1.4.A.2 3.1.4.B.5 3.1.4.C.1 4.1.4.A 4.5.4.D 4.2.4.C 3.1.5.C.1	S4.B.2.1.1 S4.B.2.1.2
2	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
2	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?	Living things can survive only where their needs are met. (LS4.D)	Construct an explanation about why living things can only survive where their needs are met. (2-LS4-1)	Biodiversity Microorganisms Needs Organism Survive	4.1.4C 4.1.4D	3.1.4.A 3.1.4.C 4.5.4.D 4.2.4.C	S4.B.2.1.2
2	Biological evolution explains both the unity	How can there be so many similarities among organisms	There are many different kinds of living things in any	Observe and compare the different kinds of living things that are found in	Biodiversity Exist	4.1.4C 4.1.4D	3.1.4.A 3.1.4.C	S4.B.2.1.1 S4.B.2.1.2

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	and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	yet so many different kinds of plants, animals, and microorganisms?	area, and they exist in different places on land and in water. (LS4.D)	different habitats. (2-LS4-1)	Habitats Land Living things Water		4.5.4.D 4.2.4.C	
Earth and Space Science								
Grade	Big Idea	Essential Question	Concepts	Competencies	Vocabulary	2002 Standards	SAS Standards	Anchor Eligible Content
2	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?	N/A	N/A	N/A	N/A	N/A	N/A
2	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 has changed over time with some changes being rapid and others being slow. Sometimes changes occur over a longer period of time than one may be able to observe. (ESS1.C)	Make observations from multiple sources to provide evidence that Earth's events can occur quickly or slowly. (2-ESS1-1)	Erosion Weathering	3.1.4.E 3.5.4.A	3.3.4.A1	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3
2	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?	Wind and water change the shape of the landscape. (ESS2.A)	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. (2-ESS2-1)	Earth materials Erosion Landform Weathering	3.5.4A	3.3.3.A1 3.3.4.A1	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3
2	The Earth is a complex	How and why is Earth	Maps display different land	Describe kinds and shapes of	Geographic	4.1.4A	3.3.4.A6	S4.A.1.1

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	and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.	constantly changing?	and water features and help show patterns in the distribution of rocks and other geological and geographical features. (ESS2.B)	patterns of landforms and bodies of water. (2-ESS2.2)	Geologic Geological Lentic Lotic Map Pennsylvania features	4.1.4B 3.5.4D		S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3
2	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?	Maps show where things are located. One can map the shapes and kinds of land and water in an area. (ESS2.B)	Develop a model to represent the shapes and kinds of land and bodies of water in an area. (ESS2-2)	Model	4.1.4A 4.1.4B 3.5.4D	3.3.4.A6	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3
2	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 is found in the ocean, rivers, lakes, ponds, and as groundwater beneath the surface. Water exists as solid ice, in liquid form, and as a vapor. (ESS2.C)	Investigate and represent the various forms of water in their local environment, on Earth, and also on other planets and moons. Use observations to construct explanations that water exists in different forms in natural landscapes. (2-ESS2-3)	Accumulation Condensation Earth Evaporation Groundwater Lake Landscape Liquid Moon Ocean Planet Pond Precipitation River Solid/ice Types of clouds Vapor/Gas		3.3.3.A4 3.3.4.A4	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3
2	The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere,	How and why is Earth constantly changing?	Water is found in the ocean, rivers, lakes, ponds, and as groundwater beneath the surface. Water exists as solid	Use observations to construct explanations that water exists in different forms in natural landscapes. (2-ESS2-3)	Accumulation Earth Groundwater Ice		3.3.4.A5 3.3.3.A5 3.3.3.A4 3.3.4.A4	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2

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	hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.		ice, in liquid form, and as a vapor. (ESS2.C)		Lake Landscape Liquid Moon Ocean Planet Pond River Solid			S4.A.3.1 S4.A.3.2 S4.A.3.3
2	The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	All materials, energy, and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways.	Investigate what resources are used in the construction of buildings, preparation of food, transportation, and other aspects of the community.	Community Energy Materials Resources Transportation		3.3.4.A2	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3