SCIENCE (Grade 1) | Curriculum Map

K-2 GRADE BAND THEME: <u>Observations of the Environment</u> This theme focuses on helping students develop skills for systematic discover to understand the science of the natural world around them in greater depth by using scientific inquiry. **Grade 1 overview:** Energy is observed through movement, heating, cooling, and the needs of living organisms.	**SCIENCE INQUIRY & APPLICATIONS: During the years of PreK-4, all students must develop the ability to** → Observe and ask questions about the natural environment. → Plan and conduct simple investigations. → Employ simple equipment and tools to gather data and extend the senses. → Use appropriate mathematics with data to construct reasonable explanations. → Communicate about observations, investigations, and explanations. → Review and ask questions about the observations and explanations of others.

PHYSICAL SCIENCE (PS)			
Motion and Materials. This topic focuses on the changes in properties that occur in objects and materials. Changes of position of an object are a result of pushing or pulling.			
OH Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
PS 1.1. <u>Properties of objects and materials can change</u>. • Objects and materials change when exposed to various conditions, such as heating or freezing. • Not all materials change in the same way.	change condition expose material object property	▪ **Recognize** that objects and materials can be three different kinds of matter. [L1] ▪ **List** properties of different kind of matter. [L1] ▪ **Observe** that materials respond to temperature changes different ways. [L2] ▪ **Record** the changes in the properties of materials when exposed to different temperature. [L2]	▪ Change matter in various ways, e.g. heating and freezing. ▪ *Interactive Science* Ch. 5 inquiry: - How can you build a (clay) boat?
PS 1.2. <u>Objects can be moved in a variety of ways</u>, such as straight, zigzag, circular and back and forth. ▪ The position of an object can be described by locating it relative to	direction (*zigzag, straight, swing, circular, back and forth*) energy force (*push, pull*)	▪ **Investigate** how objects can move in different ways. [L3] ▪ **Define** motion. [L1] ▪ **Describe** the position of an object in comparison to another object. [L2]	▪ Race car challenge: Test, experiment and investigate different ways to change the motion of different toy cars. ▪ Design, construct and test a device that will cause a ping-pong ball to move in a zigzag pattern. Test and evaluate the effectiveness

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another object or to the object's surroundings. ▪ An object is in motion when its position is changing. ▪ The motion of an object can be affected by pushing or pulling. ▪ A push or pull is a force that can make an object move faster, slower, or go in a different direction. ▪ Changes in motion are a result of changes in energy.	motion position speed	▪ **Demonstrate** how objects can be moved faster, slower or change direction by pushing or pulling the object. [L3] ▪ **Design** a machine that shows how changing force will affect an object's motion. [L4]	of the different devices made by different groups in the class. Redesign the device for greater effectiveness. ▪ *Interactive Science* Ch. 6 inquiry: - How does tube height change how fast a marble moves?

Interactive Science	**Suggested Cross-Curricular Connections for Physical Science: Motion and Materials**			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
<u>Ch.2: The Design Process</u> Lesson 1: What is technology? Lesson 2: What are objects made of? Lesson 3: What is the design process? <u>Ch. 5: Matter</u> Lesson 1: What is matter? Lesson 3: How can you change matter?	<u>Reading Informational Text (RI)</u> 1.RI.1: Ask and answer questions 1.RI.2: Text development: main ideas, details 1.RI.3: Connection between two individuals, events, ideas or pieces of information 1.RI.4: Meaning of words and phrases 1.RI.5: Text features 1.RI.6: Information from pictures versus words 1.RI.7: Use illustrations and details 1.RI.9: Identify similarities and differences between two texts on same topic	<u>Mathematical Practices (MP)</u> MP.2: Reason abstractly and quantitatively MP.7: Look for and make use of structure MP.8: Look for and express regularity in repeated reasoning <u>Geometry (G)</u> 1.G.1: Distinguish between defining attributes	<u>History (H)</u> 1.H.1: Time can be divided into categories 1.H.2: Photographs, letters, artifacts and books can be used to learn about the past 1.H.3: Ways to meet basic human needs have changed over time	<u>Careers</u>: scientist, engineer, cook/chef <u>Technology</u>

Interactive Science	Suggested Cross-Curricular Connections for Physical Science: Motion and Materials			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
Ch. 6: Movement Lesson 1: How can objects move? Lesson 2: What is a force? Lesson 3: How do light and matter interact? Lesson 4: What re heat and light energy? Lesson 5: What is sound energy?	Writing (W) W.1.2: Write informative and explanatory texts that name a topic, supply some facts about the topic, and provide some sense of closure 1.W.7: Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions)			

EARTH & SPACE SCIENCE (ESS)			
Sun, Energy and Weather. This topic focuses on the sun as a source of energy and energy changes that occur to land, air and water.			
Ohio Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
ESS 1.1. The sun is the principal source of energy. ▪ Sunlight warms Earth's land and water. ▪ The amount of exposure to sunlight affects the amount of warming or cooling of air, water and land.	air cool energy soil sunlight temperature thermometer warm	▪ **Observe** the temperature of air, water, and soil before and after being exposed to sunlight. [L1] ▪ **Use** tools to collect, measure, and record changes in temperature. [L2] ▪ **Explain** how the amount of sunlight warms or cools air, water and soil. [L3]	▪ Create daily charts of sunlight and temperature. ▪ Observe ice cubes in shade vs. sun. ▪ Melt snow/ice in various ways using body warmth, sunlight and heating. ▪ Measure temperature changes of soil, water and air in different settings and/or exposures to sunlight (e.g., select a grassy area in full sun, in partial sun or in shade and collect temperature readings). Graph, chart or table to record the data. Compare and contrast the results in writing or orally.
ESS 1.2. Water on Earth is present in many forms. ▪ The physical properties of water can change.	freeze liquid (*sleet, rain)* melt season	▪ **Identify** water in different forms. [L1] ▪ **Use** maps to locate bodies of water. [L2]	▪ Use appropriate tools to test and measure water's weight, texture, temperature or size (e.g., compare measurements of water before and after freezing, examine the texture of

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▪ These changes occur due to changing energy. ▪ Water can change from a liquid to a solid and from a solid to a liquid. **Note**: *Water as a vapor is not introduced until grade 2; the water cycle is reserved for later grades.*	solid (*ice, snowflake, hail)* thaw water (*lake, pond, stream, river, wetland, ocean, sea)*	▪ **Use** tools to measure the properties of water in different forms. [L2] ▪ **Relate** energy changes to the weather in different seasons. [L3] ▪ **Design** a freezing or melting experiment to test how energy can change the form of water. [L4]	snow or ice crystals using a hand lens) to document the physical properties. ▪ Collect temperature readings during precipitation events. Make a graph, chart or table to compare the temperatures during rainfall, snow or sleet. Discuss the patterns that are observed. ▪ Investigate the physical differences between snow, crushed ice and/or liquid water (weight, temperature, texture). Ask: How much does one cup of snow/crushed ice/liquid water weigh? How does snow/crushed ice look through a hand lens?

Interactive Science	**Suggested Cross-Curricular Connections for Earth and Space Science: Sun, Energy and Weather**			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
Ch. 4: Earth and Sky Lesson 1: What is on Earth? Lesson 2: What is the sun? Lesson 4: How can you measure weather? OH Learn More About It! ▪ *Nonrenewable Energy Resources* ▪ *Renewable Energy Resources* ▪ *Earth's Resources, Contamination, and Overuse*	Reading Literary Text (RL) 1.RL.1: Ask and answer questions 1.RL.2: Analyze text development: lesson; retell stories with key details 1.RL.4: Meaning of words: feelings or senses 1.RL.5: Explain differences between books that tell stories and those that give information 1.RL.6 Identify who is telling story	Mathematical Practices (MP) MP.5: Use appropriate tools strategically MP.6: Attend to precision Measurement and Data (MD) 1.MD.4: Organize, represent, and interpret data with up to three categories	Economics (E) 1.E.11: Wants are unlimited; resources are limited; individuals make choices 1.E.12: People produce and consume goods and services in the community 1.E.13: People trade to obtain goods and services 1.E.14: Currency is used as a means of exchange	Careers: solar engineer, meteorologist Technology

Interactive Science	Suggested Cross-Curricular Connections for Earth and Space Science: Sun, Energy and Weather			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
Note: *Air and water are not included in Ch. 4 and will need to be supplemented.*	1.RL.7: Use illustrations and details to describe characters, settings, or events 1.RL.9: Compare and contrast adventures and experiences of story characters Writing (W) W.1.3: Write narratives to recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure			

LIFE SCIENCE (LS)			
Basic Needs of Living Things. This topic focuses on the physical needs of living things in Ohio. Energy from the sun or food, nutrients, water, shelter and air are some of the physical needs of living things.			
OH Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
LS 1.1. Living things have basic needs, which are met by obtaining materials from the physical environment. ▪ Living things require energy, water, and a particular range of temperatures in their environments. ▪ Plants get energy from sunlight. ▪ Animals get energy from plants and other animals.	basic need (*energy, sunlight, water*) temperature range environment living nonliving resource	▪ **Draw** and **name** living and nonliving things in our environment. [L1] ▪ **List** the basic needs of living things in order to survive. [L1] ▪ **Describe** what a resource is. [L2] ▪ **Explain** and **contrast** the way that plants and animals get energy. [L3] ▪ **Connect** the survival of living things to resources in their environment. [L4]	▪ Take nature walks. ▪ Design a bird feeder and blend of birdseed that will attract the most birds of one kind or the greatest variety of birds. Share designs and results: Does the type of food influence what type of birds will come to a bird feeder? Materials: pinecones, bagels, soy butter, cream cheese, vegetable shortening, bird feeder, bird food

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▪ Living things acquire resources from the living and non-living components of the environment.			▪ Design an experiment for growing plants. Materials: seeds for planting (lima beans, peas, marigold, sunflowers etc.), soil, plastic bags, paper towels; light space and dark space ▪ *Interactive Science* Ch. 3 inquiry: - Do plants need water?
LS 1.2. Living things survive only in environments that meet their needs. ▪ Resources are necessary to meet the needs of an individual and populations of individuals. ▪ Living things interact with their physical environments as they meet those needs. ▪ Effects of seasonal changes within the local environment directly impact the availability of resources.	animal needs (*food sources, water, space, shelter)* available individual interact plant needs (*light, water, air, nutrients, time, temperature)* population seasonal changes survive	▪ **Investigate** the basic needs of plants and animals. [L3] ▪ **Name** resources in an environment that help plants and animals meet their needs. [L1] ▪ **Describe** how living things interact with their environments in order to survive. [L2] ▪ **Compare** and **contrast** the basic needs of animals and plants. [L3] ▪ **Analyze** how seasonal changes affect the needs of plants and animals. [L4]	▪ Zoo visit: Observe the varied environments that are found at the zoo and how the animals need that environment to survive. Ex.: Is the alligator outside all year? Why? ▪ Participate in education class at the Columbus Zoo called Discover Ohio Animals: Teaches about habitats in Ohio and what kinds of animals live there and why. ▪ Class pets: Try out different kinds of food to see what it likes best. ▪ Explain, draw, journal and photograph what happens to local living and nonliving environments over the course of a school year. ▪ Monitor a specific plant or animal over a long period. Observe and record the behavioral and physical changes that occur in that animal or plant. ▪ Match pictures of local plants and animals to the environment in which they can be found.

Interactive Science	Suggested Cross-Curricular Connections for Life Science: Basic Needs of Living Things			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
Ch. 3: Living Things and Their Environment Lesson 1: What are nonliving and living things? Lesson 2: What do living things need? Lesson 3: How do plants and animals live in land environments? Lesson 4: How do plants and animals live in water environments?	Reading Informational Text (RI) 1.RI.1: Ask and answer questions 1.RI.2: Text development: main ideas, details 1.RI.3: Connection between two individuals, events, ideas or pieces of information 1.RI.6: Information from pictures versus words 1.RI.7: Use illustrations and details 1.RI.8: Identify reasons an author gives to support points 1.RI.9: Identify similarities and differences between two texts on same topic Writing Opinion (W) 1.W.1: Write opinion pieces that introduce the topic or name the book being written about, express an opinion, supply a reason for the opinion, and provide some sense of closure 1.W.8: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question	Mathematical Practices (MP) 1.MP.3: Construct viable arguments and critique the reasoning of others	History (H) 1.H.4: Maps can be used to locate and identify places 1.H.5: Places are distinctive because of their physical characteristics Geography (G) 1.G.6: Families interact with the physical environment differently in different times and places 1.G.7: Diverse cultural practices address basic human needs in various ways; may change over time	Careers: gardener, farmer, horticulturalist, zoologist Technology

District Instructional Resources:

Interactive Science (2012) / Pearson – six-year adoption (2019-2020 to 2024-2025) that includes resources:

- Digital texts only (online student edition, videos, virtual labs, simulations, animations, vocabulary match, assessments, and leveled readers with ELL support)
- Inquiry (activity cards, materials equipment kit)
- Readers' theater, science songs
- STEM activity book

Standards Alignment:

Ohio Learning Standards – retrieved Feb. 11, 2019 from
http://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Science/Ohios-Learning-Standards-and-MC/SciFinalStandards121018.pdf.aspx?lang=en-US

Levels of Complexity / Performance Verbs:

Level I - Recall	Level 2 - Skill/Concept	Level 3 - Strategic Thinking	Level 4 - Extended Thinking
▪ Arrange ▪ Choose ▪ Define ▪ Draw ▪ Label ▪ List ▪ Name ▪ Recognize ▪ Tell	▪ Categorize ▪ Collect ▪ Describe ▪ Document ▪ Estimate ▪ Illustrate ▪ Measure ▪ Observe ▪ Organize ▪ Predict ▪ Record ▪ Represent ▪ Use	▪ Apply ▪ Classify ▪ Compare ▪ Communicate ▪ Contrast ▪ Demonstrate ▪ Determine ▪ Develop ▪ Explain ▪ Identify ▪ Investigate ▪ Plan ▪ Relate ▪ Support	▪ Analyze ▪ Assess ▪ Conduct ▪ Connect ▪ Create ▪ Design ▪ Evaluate ▪ Explore ▪ Infer