SCIENCE (Grade 3) | Curriculum Map

3-5 GRADE BAND THEME: <u>Interconnections within Systems</u> This theme focuses on helping students explore the components of various systems and then investigate dynamic and sustainable relationships within systems using scientific inquiry. **Grade 3 overview:** Matter is what makes up all substances on Earth. Matter has specific properties and exists in different states. Earth's resources are made of matter. Matter can be used by living things and can be used for the energy they contain. There are many different forms of energy. Each living component of an ecosystem is composed of matter and uses energy	**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)

Matter and Forms of Energy. This topic focuses on the relationship between matter and energy. Matter has specific properties and is found in all substances on Earth. Heat is a familiar form of energy that can change the states of matter.

OH Science Standards (2018)	Essential Vocabulary	Student Learning Targets	Suggested Investigations
3.PS.1 - All objects and substances in the natural world are composed of <u>matter</u>. ▪ Matter takes up space and has mass. **Note:** *Differentiating between mass and weight is not necessary at this grade level.*	mass matter substance volume	▪ **Define** matter. [L1]	
3.PS.2 - Matter exists in <u>different states</u>, each of which has different <u>properties</u>. ▪ The most recognizable states of matter are solids, liquids and gases. ▪ Shape and compressibility are properties that can distinguish between the states of matter.	solid liquid gas heating cooling property (*texture, color, size, shape, compressibility*)	▪ **List** and **illustrate** the three states of matter (solid, liquid, or gas). [L1] ▪ **Contrast** the properties of shape and compressibility in different states of matter. [L3] ▪ **Conduct** a demonstration to show how matter can change states. [L2]	▪ Compare the three states in which water can be found. Relate this to weather forms. ▪ Use a hair dryer to melt crayons. ▪ Blend fruit into a liquid. Freeze into popsicles.

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▪ One way to change matter from one state to another is by heating or cooling.		▪ **Explain** how heating or cooling can change matter from one state to another. [L3]	▪ Experiment with packing material to see what can keep ice frozen the longest.
3.PS.3 - Heat, electrical energy, light, sound, and magnetic energy are <u>forms of energy</u>. ▪ There are many different forms of energy. ▪ Energy is the ability to cause motion or create change. **Note**: *The different forms of energy that are outlined at this grade level should be limited to familiar forms that a student is able to observe.*	energy (*heat, electrical, light, sound, magnetic*) motion change	▪ **Define** "energy" as the ability to cause motion or create change in matter. [L1] ▪ **Recognize** different forms of energy and their source. [L1] ▪ **Describe** how energy affects matter. [L2]	▪ Design a magnet maze. ▪ Research and compare and contrast different ways energy can be generated in nature and how it is used to cause motion.

Interactive Science	**Suggested Cross-Curricular Connections for Physical Science: Matter and Forms of Energy**			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
<u>Ch. 6: Matter</u> Lesson 1: What is matter Lesson 2: What are states of matter? Lesson 3: How is matter measured? <u>Ch. 7: Energy and Its Forms</u> Lesson 1: What are some forms of energy? Lesson 2: How does energy change form? Lesson 3: How do light and matter interact?	<u>Reading Informational Text</u> (RI) 3.RI.1: Ask and answer questions 3.RI.2: Text development: main ideas, details 3.RI.3: Relationship between events, ideas, concepts, or steps; time, sequence, cause-effect 3.RI.4: Meaning of content and academic vocabulary 3.RI.5: Text features; search tools 3.RI.7: Illustrations add meaning to the text 3.RI.9: Compare and contrast main ideas and key details of two texts.	<u>Measurement and Data (MD)</u> 3.MD.2: Measure and estimate liquid volume and mass using metric units.	<u>Economics (E)</u> 3.E.17: Consumer: goods and services satisfy wants. Producers: make goods; provide services 3.E.18: Market: buyers and sellers exchange goods and services. 3.E.19: Weigh costs and benefits when making decisions. 3.E.20: Budgets	<u>Careers</u> meteorologist

Interactive Science	Suggested Cross-Curricular Connections for Physical Science: Matter and Forms of Energy			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
Lesson 4: What re heat and light energy? Lesson 5: What is sound energy? OH Learn More About It! ▪ *Compressing Matter*	Writing (W) 3.W.2: Write informative or explanatory texts to examine a topic and convey ideas and information clearly			

EARTH & SPACE SCIENCE (ESS)			
Earth's Resources. This topic focuses on Earth's resources. While resources can be living and nonliving, within this strand, the emphasis is on Earth's nonliving resources, such as water, air, rock, soil, and the energy resources they represent.			
Ohio Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
3.ESS.1 - Earth's nonliving resources have specific properties. ▪ Soil is composed of pieces of rock, organic material, water and air and has characteristics that can be measured and observed. **Note**: *Use the term "soil", not "dirt." Dirt and soil are not synonymous.* ▪ Rocks have specific characteristics that allow them to be sorted and compared. ▪ Rocks form in different ways. ▪ Air and water are also nonliving resources. ***Note**: Rock classification is not the focus for this grade level; this is found in grade 6. At this grade, the observable characteristics of rocks can be used to sort or compare, rather than formal classification.*	resource (*living, nonliving*) organic characteristic property (*color, texture, grain, moisture, composition, measure, observe*) soil	▪ **Define** and **list** examples of living and non-living resources. [L1] ▪ **Explain** how air and water are used as resources. [L3] ▪ **Use** tools to **observe** and **describe** the composition of soil. [L2] ▪ **Examine** and **sort** rocks according to their properties. [L2] ▪ **Investigate** and **develop** a model that shows the different ways that rocks form. [L3, L4]	▪ Design a way to test the ability of different soil composition samples to retain water. ▪ Experiment with different water filters to see which can better filter organic and non-organic material from water. ▪ Design a garden experiment to see which types of soil are better for certain plants. ▪ Conduct a soil investigation of backyard soils. Compare and contrast composition and plot on a community map.

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Ohio Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
ESS 3.2. Earth's resources can be used for energy. ▪ Renewable energy resources, such as wind, water, or solar energy, can be replenished within a short amount of time by natural resources. ▪ Nonrenewable energy is a finite resource, such as natural gas, coal, or oil, which cannot be replenished in a short amount of time.	finite replenish renewable energy (*solar, water, wind*) non-renewable energy (*fossil fuel, natural gas, coal, oil*)	▪ **Explain** what makes a resource renewable or non-renewable. [L3] ▪ **Name** examples of renewable and of non-renewable resources. [L1] ▪ **Demonstrate** how Earth's resources are used to provide energy in our daily lives. [L3]	▪ Design a simple energy collection system that would make use of natural resources found in Bexley or Central Ohio.
ESS 3.3. Some of Earth's resources are limited. ▪ Some of Earth's resources become limited due to overuse and/or contamination. ▪ Reducing resource use, decreasing waste and/or pollution, recycling and reusing can help conserve these resources.	conserve contaminate decrease natural resource overuse pollute recycle reduce reuse waste	▪ **Name** at least three ways to conserve resources. [L1] ▪ **Investigate** and **communicate** ways that people are overusing or contaminating natural resources. [L3]	▪ Research the ways resources are used in the school; identify ways resources could be reduced, recycled or reused. ▪ Research recycling systems. ▪ Visit Rumpke or SWACO.

Interactive Science	**Suggested Cross-Curricular Connections for Earth and Space Science: Earth's Resources**			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
Ch. 5: Earth's Materials Lesson 1: What are minerals and rocks? Lesson 2: What is soil?	Reading Informational Text (RI) 3.RI.1: Ask and answer questions 3.RI.2: Text development: main ideas, details	Measurement and Data (MD) 3.MD.3: Create scaled picture graphs to represent a data set 3.MD.7a: Find the area of a rectangle	Geography (G) 3.G.4: Physical and political maps 3.G.5: Daily life is influenced by agriculture,	Careers: environmental scientist, engineer, geologist, green energy jobs

Interactive Science	Suggested Cross-Curricular Connections for Earth and Space Science: Earth's Resources			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
OH Learn More About It! ▪ *Nonrenewable Energy Resources* ▪ *Renewable Energy Resources* ▪ *Earth's Resources, Contamination, and Overuse* ***Note:*** *Air and water are not included in Ch. 5 and will need to be supplemented.*	3.RI.3: Relationship between events, ideas, concepts, or steps; time, sequence, cause-effect 3.RI.4: Meaning of content and academic vocabulary 3.RI.6: Reader's perspective versus author's 3.RI.8: Describe relationship between evidence and author's points 3.RI.9: Compare and contrast main ideas and key details of two texts. Writing (W) 3.W.1 Write opinion pieces on topics or texts, supporting a point of view with reasons	3.MD.7d: Recognize area as additive 3.MD.8: Real-world problems involving perimeter	industry and natural resources. 3.G.6: Humans modify the environment. Economics (E) 3.E.15: Positive and negative incentives affect individuals' choices and behaviors. 3.E.16: Individuals make decisions because of resource scarcity. Trade-offs.	Technology

LIFE SCIENCE (LS)			
Behavior, Growth and Changes. This topic explores life cycles of organisms and the relationship between the natural environment and an organism's (physical and behavioral) traits, which affect its ability to survive and reproduce.			
OH Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
3.LS.1: Offspring resemble their parents and each other. ▪ Individual organisms inherit many traits from their parents indicating a reliable way to transfer information from one generation to the next.	generation interact offspring organism trait (*behavioral, Inherited, learned*)	▪ **Observe** which traits in animals or plants come from their parents. [L2] ▪ **Distinguish** between behaviors that an organism learns and those that it inherits. [L1]	▪ Inherited traits survey. Children will chart/graph traits in their families. ▪ Children will bring in photos of themselves and their parents to compare and contrast ▪ Research project: Have students make posters of adult and baby animals. Compare and contrast those that look

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▪ Some behavioral traits are learned through interactions with the environment and are not inherited.		▪ **Determine** and **communicate** behavior traits that are learned from interacting with the environment. [L3]	similar – just smaller (e.g., humans) and those that look very different (e.g., a tadpole and a frog).
3.LS.2: Individuals of the same kind of organism differ in their <u>inherited traits</u>. These differences give some individuals an advantage in surviving and/or reproducing. ▪ Plants and animals have physical features that are associated with the environments where they live. ▪ Plants and animals have certain physical or behavioral characteristics that influence their chances of surviving in particular environments. **Note**: *The focus is on the individual, not the population. Adaptation is not the focus at this grade level.*	characteristic feature behavior survive predator prey adaptation environment advantage	▪ **Illustrate** and **describe** how physical features help a plant or animal survive in its environment. [L2] ▪ **Compare** and **contrast** animal behaviors that help them survive in their environment. [L3]	▪ Explore Steve Jenkins books. ▪ Choose a habitat. Design imaginary animals with physical features and behaviors that would help their animal survive in that environment. ▪ Interactive Science, Gr. 4, Ch.3 Lesson 3: What plant and animal characteristics are inherited?
3.LS.3: Plants and animals have <u>life cycles</u> that are part of their adaptations for survival in their natural environments. ▪ Worldwide, organisms are growing, reproducing, dying and decaying. ▪ The details of the life cycle are different for different organisms, which affects their ability to survive and reproduce in their natural environments. **Note:** *The names of the stages within the life cycles are not the focus.*	birth/born death/die decay habitat life cycle reproduce	▪ **Relate** different stages of an animal or plant's life cycle to its environment. [L3] ▪ **Construct** a model showing an organism's life cycle. [L4]	▪ Chick Quest – Share through web cams ▪ Visit the Conservatory's Butterfly Exhibit. ▪ Change Poetry: Children write a short poem describing changes in an animal's life. ▪ Compare and contrast the life cycles of two different animals (e.g., human and frog, butterfly and frog).

Interactive Science	Suggested Curricular Connections for Life Science: Behavior, Growth and Changes			
	English Language Arts	**Mathematics**	**Social Studies**	**Other**
Ch. 3: Plants Lesson 1: How do plants use roots and stems to grow? Lesson 2: How do plants use flowers or cones to reproduce? Lesson 3: What are the life cycles of some plants? Ch. 4: Living Things Lesson 1: How are offspring like their parents? Lesson 2: What are the life cycles of some animals?	Reading Literary Text (RL) 3.RI.1: Ask and answer questions 3.RI.2: Analyze text development: theme, key details; fables, folktales, and myths 3.RI.3: Describe characters; explain how actions contribute to event sequence 3.RI.4: Meaning of words; literal vs. non-literal 3.RI.5: Parts of stories, drama and poetry; explain construction 3.6: Distinguish between first and third person 3.7: Illustrations contribute to meaning 3.9: Compare and contrast themes, settings and plots Writing (W) 3.W.3: Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.	Mathematical Practices (MP) 3.MP.7: Look for and make use of structure Operations and Algebraic Thinking (OA) 3.OA.9: Identify arithmetic patterns Measurement and Data (MD) 3.MD.4: Generate measurement data	History (H) 3.H.1: Local history can be shown on timelines 3.H.2: Primary and secondary sources can show change over time 3.H.3: Local communities change over time Geography (G) 3.G.7: Transportation and communication systems 3.G.8: Communities may include diverse cultural groups Economics (E) 3.E.14: Line graphs show change over time	Careers: Biologist, doctor Technology

District Instructional Resources:

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

- Paper/write-in student edition
- Digital texts (online student edition, videos, virtual labs, simulations, animations, vocabulary match, assessments)
- Inquiry (activity cards, materials equipment kit)
- 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