SCIENCE (Grade 2) | 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 physical world around them in greater depth by using scientific inquiry. **Grade 2 overview:** Living and nonliving things may move. A moving object has energy. Air moving is wind and wind can make a windmill turn. Changes in energy and movement can cause change to organisms and the environments in which they live.	**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.

EARTH & SPACE SCIENCE (ESS)

Atmosphere. This standard strand focuses on air and water as they relate to weather and changes that can be observed and measured.

OH Science Standards (2018)	Essential Vocabulary	Student Learning Targets	Suggested Investigations
2.ESS.1: The <u>atmosphere</u> is primarily made up of air. ▪ Air has properties that can be observed and measured. ▪ The transfer of energy in the atmosphere causes air movement, which is felt as wind. ▪ Wind speed and direction can be measured.	atmosphere air property (*space*, *mass*) energy transfer cause instrument (*weather vane*, *anemometer*) wind (*hurricane*, *tornado*) speed direction	▪ **Describe** and **measure** the properties of air. [L2] ▪ **Investigate** the role that wind plays in weather events. [L3] ▪ **Explain** how the heating and cooling of air creates wind. [L3] ▪ **Measure** and **document** wind speed, direction and temperature with a variety of tools. [L2] ▪ **Analyze** the data collected (review, compare, contrast, infer, and ask questions). [L4]	▪ Create weather instruments to measure wind speed and wind direction (anemometer, weather vane, etc.). ▪ Create a daily weather calendar (link to math standards: graphing). ▪ Conduct balloon observations and data collection to illustrate that air has mass and takes up space. ▪ Visit a meteorologist or invite one to speak to the grade level. ▪ Visit a wind turbine. ▪ Keep weather journals.

EARTH & SPACE SCIENCE (ESS)			
Atmosphere. This standard strand focuses on air and water as they relate to weather and changes that can be observed and measured.			
OH Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
2.ESS.2: <u>Water</u> is present in the atmosphere. ▪ Water is present in the atmosphere as water vapor. ▪ When water vapor in the atmosphere cools, it forms clouds, fog, rain, ice, snow, sleet or hail. **Note:** The emphasis at this grade level is investigating condensation and evaporation, not memorizing the water cycle itself. **Note:** The emphasis is not in naming cloud types, but in relating the characteristics of the clouds with weather.	vapor (*cloud*, *fog*, *mist*) condensation evaporation precipitation (*rain*, *ice*, *snow*, *sleet*, *hail*)	▪ **List** the different forms of water vapor present in the atmosphere. [L1] ▪ **Observe** how water evaporates and condenses in simple demonstrations. [L2] ▪ **Illustrate** the water cycle. [L2] ▪ **Describe** the characteristics of clouds (color, shape, height, movement). [L2] ▪ **Explain** how the cooling of water vapor changes its form. [L3]	▪ Use containers to test the effects of sun on evaporation and condensation rates. ▪ Investigate what factors contribute to evaporation (use containers with water and various pollutants, varying temperatures, etc.). ▪ Conduct cloud observations as related to precipitation. ▪ Conduct water cycle demonstrations (hot plate, standing water over time, etc.). ▪ Make clouds in a container. ▪ Research a weather event/storm and report in writing.
2.ESS.3: Long- and short-term <u>weather changes</u> occur due to changes in energy. ▪ Changes in energy affect all aspects of weather, including temperature, precipitation, and wind.	weather change	▪ **Observe** and **document** changes in the weather. [L2] ▪ **Design** a simple experiment to demonstrate the properties of air, wind, or water vapor. [L4]	▪ Keep weather journals with data collection, comparisons and graphing using Weather Bug and other digital resources. ▪ Research severe weather events. ▪ Use graphic organizers to compare weather events. ▪ Study weather maps: http://www.weatherwizkids.com/ http://www.brainpopjr.com/science/weather/ https://eo.ucar.edu/webweather/ www.WeatherBug.com

LIFE SCIENCE (LS)			
Interactions within Habits. This standard strand focuses on how ecosystems work by observations of simple interactions between the biotic/living and abiotic/nonliving parts of an ecosystem. Just as living things impact the environment in which they live, the environment impacts living things.			
OH Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets**	**Suggested Investigations**
2.LS.1: <u>Living things cause changes</u> on Earth. ▪ Living things function and interact with their physical environments. ▪ Living things cause changes in the environments where they live; the changes can be very noticeable or slightly noticeable, fast or slow. **Note:** At this grade level, discussion is limited to changes that can be easily observed.	cause environment habitat impact interact living thing	▪ **Investigate** and **identify** ways that living things interact with their environment. [L3] ▪ **Observe** and **document** how living things cause changes in their environment over time. [L1] ▪ **Contrast** an environment at two different times and identify changes. [L3] ▪ **Infer** how living things caused the changes in the environment. [L4]	▪ Participate in a scavenger hunt for living and nonliving things. ▪ Read literature on various habitats. Make a matrix which describes the habitat, what lives there, and interactions between plants and animals and changes over time. ▪ Observe classroom habitats, such as class pets, ant farm, worm habitat, aquarium, terrarium; journal changes in the system and make connections on what is happening in habitat to what is happening in nature. ▪ Make observations of habitats near school. ▪ Grow plants (e.g., school garden). ▪ Read aloud *A Log's Life*. Discuss, chart and/or illustrate interactions.
2.LS.2: All organisms alive today result from their ancestors, some of which may be <u>extinct</u>. Not all kinds of organisms that lived in the past are represented by living organisms today. ▪ Some kinds of organisms become extinct when their basic needs are no longer met or the environment changes.	ancestor organism extinct fossil basic needs	▪ **Compare** organisms that are alive today with those that are extinct. [L3] ▪ **Assess** examples of organisms that no longer exist on Earth and develop reasonable ideas about what happened to them. [L4]	▪ Research and write brief reports on extinct animals (link to ELA). ▪ Practice being a paleontologist, making observations and recording data in a journal. ▪ Make fossils. ▪ Make connections between extinct and extant animals.

PHYSICAL SCIENCE (PS)			
Changes in Motion. This standard strand focuses on observing the relationship between forces and motion.			
OH Science Standards (2018)	**Essential Vocabulary**	**Student Learning Targets ("I can…")**	**Suggested Investigations**
2.PS.1: Forces change the motion of an object. ▪ Motion can increase, change direction or stop depending on the force applied. ▪ The change in motion of an object is related to the size of the force. ▪ Some forces act without touching, such as using a magnet to move an object or objects falling to the ground.	motion increase force magnet	▪ **Describe** different types of motion. [L2] ▪ **Illustrate** and **demonstrate** how force is needed to change the motion of an object. [L2] ▪ **Determine** how the amount of force on an object can change an object's speed, distance, or direction. [L3] ▪ **Explore** and **draw conclusions** about forces that move objects without touching them. [L4]	▪ See OH Model Curriculum (ODE) for example experiments and activities. ▪ Investigate ways to push and pull objects on a variety of surfaces. ▪ Measure speed direction and distance traveled. ▪ Investigate dropping objects of various sizes from the same height at the same time. ▪ Make a nail into a magnet; use the magnet to pick up various objects; and chart and collect data. ▪ Investigate attraction and repulsion with magnets.

District Instructional Resources:

Interactive Science (2017) / 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

Science Fundamentals	Earth & Space Science (ESS)	Physical Science (PS)	Life Science (LS)
Ch. 1: The Nature of Science Ch. 2: Technology and Tools	Ch. 4: Weather Ch. 5: Matter	Ch. 6: Energy, Motion, and Force	Ch. 3: Plants and Animals

Options for Literature Integrations:

Earth & Space Science (ESS)	Physical Science (PS)	Life Science (LS)
Feel the Wind (A. Dorros) *Temperature: Heating Up and Cooling Down* (D. Stille) *Why Does Water Evaporate?* (R. Moore) *Oh Say Can You Say What's the Weather Today?* (T. Rabe) *The Water Cycle* (R. Olien) *Science Kids: Weather* (C. Harris) *Evaporation: Matter* (W. Rice) *Energy Makes Things Happen* (K. Bradley) *What Will the Weather Be?* (L. DeWitt) *Down Comes the Rain* (F. Branley) *Clouds* (A. Rockwell) *Air: Outside, Inside, and All Around* (D. Stille)	*Forces Make Things Move* (K. Bradley) *Move It: Motion, Forces and You* (A. Mason) *Magnets: Pulling Together, Pushing Apart* (N. Rosinsky) *What Makes a Magnet?* (F. Branley)	*Fossils Tell of Long Ago* (Aliki) *The Extinct Files: My Science Project* (E. Wallace) *Mammoths on the Move* (L. Wheeler) *Monster Bones: The Story of a Dinosaur Fossil* (J. Bailey) *Archaeologists Dig for Clues* (K. Duke) *Is It a Living Thing?* (B. Kalman) *What is a Living Thing*? (B. Kalman)

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	▪ Categorize ▪ Collect ▪ Describe ▪ Document ▪ Estimate ▪ Illustrate	▪ Apply ▪ Classify ▪ Compare ▪ Communicate ▪ Contrast ▪ Demonstrate	▪ Analyze ▪ Assess ▪ Conduct ▪ Connect ▪ Create ▪ Design

Level I - Recall	Level 2 - Skill/Concept	Level 3 - Strategic Thinking	Level 4 - Extended Thinking
▪ Name ▪ Recognize ▪ Tell	▪ Measure ▪ Observe ▪ Organize ▪ Predict ▪ Record ▪ Represent ▪ Use	▪ Determine ▪ Develop ▪ Explain ▪ Identify ▪ Investigate ▪ Plan ▪ Relate ▪ Support	▪ Evaluate ▪ Explore ▪ Infer