

SCIENCE (Grade 7) | Curriculum Map and Pacing Guide

<p>COURSE DESCRIPTION: Seventh grade science requires students to use scientific inquiry to discover patterns, trends, structures, and relationships that may be described by simple principles. These principles are related to the properties or interactions within and between systems. Students will study:</p> <ul style="list-style-type: none"> ▪ <u>Earth and Space Science.</u> Earth’s hydrologic cycle, patterns that exist in atmospheric and oceanic currents, the relationship between thermal energy and the currents, and the relative position and movement of the Earth, sun and moon. ▪ <u>Physical Science.</u> Empirical evidence for the arrangements of atoms on the Periodic Table of Elements, conservation of mass and energy, transformation and transfer of energy. ▪ <u>Life Science.</u> Impact of matter and energy transfer within the biotic component of ecosystems. 	<p>Science Inquiry and Application (SIA): <i>All grades 6-8 students will use the following scientific processes with appropriate laboratory safety techniques to construct their knowledge and understanding:</i></p> <ul style="list-style-type: none"> ▪ Identify questions that can be answered through scientific investigations. (SIA.1) ▪ Design and conduct a scientific investigation. (SIA.2) ▪ Use appropriate mathematics, tools and techniques to gather data and information. (SIA.3) ▪ Analyze and interpret data. (SIA.4) ▪ Develop descriptions, models, explanations and predictions. (SIA.5) ▪ Think critically and logically to connect evidence and explanations. (SIA.6) ▪ Recognize and analyze alternative explanations and predications. (SIA.7) ▪ Communicate scientific procedures and explanations. (SIA.8)
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QUARTER 1		
Ohio Science Standards (2018)	Student Learning Targets	Essential Investigations
<p style="text-align: center;">Earth and Space Science (ESS)</p> <p>7.ESS.1: The hydrologic cycle illustrates the changing state of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.</p>	<ul style="list-style-type: none"> ▪ Connect density and thermal energy changes to changes in the state of water. (ESS.1) ▪ Analyze how Earth’s spheres are affected by contamination. (ESS.1) 	<ul style="list-style-type: none"> ▪ Hydrologic Cycle Choice Board (ESS.1, SIA.5) ▪ Porosity / Gizmos (ESS.1, SIA.4) ▪ Water Cycle / Gizmos (ESS.1, SIA.5) ▪ Current Problems with Earth’s Water Project (ESS.1, SIA.7) ▪ Gizmos Reflections (SIA.8) ▪ AHA Connections (SIA.8)

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QUARTER 2

Ohio Science Standards (2018)	Student Learning Targets	Essential Investigations
<p align="center"><u>Earth and Space Science (ESS)</u></p> <p>7.ESS.2: Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.</p> <p>7.ESS.3: The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.</p>	<ul style="list-style-type: none"> ▪ Analyze the effects of changes in biotic and abiotic factors within a biome. (ESS.2) ▪ Explain how changes in the atmosphere (natural and human – i.e., greenhouse gases) are interconnected with Earth’s spheres. (ESS.3) 	<ul style="list-style-type: none"> ▪ Water vs. Air Molecule Investigation and Simulation (ESS.2, SIA.4) ▪ Model Oceans Investigation and Simulation (ESS.2, SIA.1) ▪ Mystery Locations Activity (ESS.2, SIA.4) ▪ Greenhouse Effect / Gizmos (ESS.3, SIA.3) ▪ Climate Change Project (ESS.3, SIA.6) ▪ Gizmos Reflections (SIA.8) ▪ AHA Connections (SIA.8)

QUARTER 3

Ohio Science Standards (2018)	Student Learning Targets	Essential Investigations
<p align="center"><u>Earth and Space Science (ESS)</u></p> <p>7.ESS.4: The relative patterns of motion and positions of Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.</p> <p>7.ESS.5: The relative positions of Earth and the sun cause patterns we call seasons.</p> <p align="center"><u>Physical Science (PS)</u></p> <p>7.PS.1: Elements can be organized by properties.</p> <p>7.PS.2: Matter can be separated or changed, but in a closed system, the number and types of atoms remains constant.</p>	<ul style="list-style-type: none"> ▪ Prove that eclipses, tides and phases of the moon are predictable and cyclical. (ESS.4) ▪ Explain the phenomena of seasons on Earth. (ESS.5) ▪ Provide information about an element based on its location within the Periodic Table of Elements. (PS.1) ▪ Use evidence to support the Law of Conservation of Matter. (PS.2) 	<ul style="list-style-type: none"> ▪ Moon Movement Investigation (ESS.4, SIA.5) ▪ Moon Lollipop Model Investigation (ESS.4, SIA.5) ▪ Eclipses / Gizmos (ESS.4, SIA.3) ▪ Tides / Gizmos (ESS.4, SIA.3) ▪ Tides and Moon Phases Graphing Activity (ESS.4, SIA.4) ▪ Seasons / Gizmos (ESS.5, SIA.3) ▪ Periodic Table of Elements Organization and Analysis Investigation (PS.1, SIA.7) ▪ Lavoisier Law of Conservation of Matter investigations (PS.2, SIA.2) ▪ Chemical Equations / Gizmos (PS.2, SIA.3) ▪ Gizmos Reflections (SIA.8) ▪ AHA Connections (SIA.8)

QUARTER 4		
Ohio Science Standards (2018)	Student Learning Targets	Essential Investigations
<p>Physical Science (PS)</p> <p>7.PS.3: Energy can be transformed or transferred but is never lost.</p> <p>7.PS.4: Energy can be transferred through a variety of ways.</p> <p>Life Science (LS)</p> <p>7.LS.1: Energy flows and matter is transferred continuously from one organism to another and between organisms and their physical environments.</p> <p>7.LS.2: In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.</p>	<ul style="list-style-type: none"> ▪ Use evidence to support the Law of Conservation of Energy. (PS.3) ▪ Display energy transfers (mechanical, electromagnetic, thermal and electrical) through various objects. (PS.4) ▪ Connect current, voltage and resistance to a circuit. (PS.4) ▪ Explain the energy and matter cycle of interdependence between photosynthesis and cellular respiration. (LS.1) ▪ Analyze the effects of changes in biotic and abiotic factors within a biome. (LS.2) 	<ul style="list-style-type: none"> ▪ Law of Conservation of Energy Mini Investigations (PS.3, SIA.2) ▪ Energy Transformation Investigations (PS.4, SIA.1) ▪ Waves Online Simulation (PS.4, SIA.5) ▪ SNAP Circuits Investigation (PS.4, SIA.5) ▪ Plants and Snails / Gizmos (LS.1, SIA.2) ▪ Cell Energy Cycle / Gizmos (LS.1, SIA.5) ▪ Consequences of Biome Changes Project (LS.2, SIA.7) ▪ Gizmos Reflections (SIA.8) ▪ AHA Connections (SIA.8)

District Instructional Resources:

Science Fusion (2017) / Houghton Mifflin Harcourt (6-year online subscription: 2019-2020 to 2024-2025)

Gizmos (online simulations – annual subscription) - <https://www.explorellearning.com/>

Ohio Science Standards:

Ohio Learning Standards (2018) – retrieved Jan. 2, 2019

<http://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Science/Ohios-Learning-Standards-and-MC/SciFinalStandards121018.pdf.aspx?lang=en-US>