BEXLEY CITY SCHOOLS

SCIENCE (Grade 6) | Curriculum Map and Pacing Guide

COURSE DESCRIPTION:	**Science Inquiry and Application (SIA)**:
Sixth grade science requires students to use scientific inquiry to discover patterns, trends, structures, and relationships that may be inferred from simple principles. These principles are related to the properties or interactions within and between systems. Students will study: ▪ Earth and Space Science. Rocks, minerals and soil compose the lithosphere; classifying and identifying different types of rocks, minerals and soil can decode the past environment in which they formed. ▪ Physical Science. Foundational concepts of the particulate nature of matter, linear motion, and kinetic and potential energy. ▪ Life Science. Basics of Modern Cell Theory - all organisms are composed of cells, which are the fundamental unit of life; cells carry on the many processes that sustain life, and all cells come from pre-existing cells.	***All grades 6-8 students will use the following scientific processes with appropriate laboratory safety techniques to construct their knowledge and understanding:*** ▪ 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)

QUARTER 1		
Ohio Standards (2018)	**Student Learning Targets**	**Essential Investigations**
Earth and Space Science (ESS) **6.ESS.1:** Minerals have specific quantifiable properties. **6.ESS.2:** Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and classification. **6.ESS.3:** Igneous, metamorphic and sedimentary rocks form in different ways. **6.ESS.4:** Soil is unconsolidated material that contains nutrient matter and weathered rock.	▪ Identify minerals by observing and measuring their properties. (ESS.1) ▪ Sort a sample of rocks into one of three categories: igneous, metamorphic and sedimentary. (ESS.2) ▪ Make connections on how rock types provide information about the environment in which it was formed. (ESS.3)	▪ Mineral Identification Investigation (ESS.1, SIA.3) ▪ Rock Identification Investigation (ESS.2, SIA.3) ▪ Rock Cycle Investigation (ESS.3, SIA.8) ▪ Creating Models of Igneous, Sedimentary and Metamorphic Rocks (ESS.3, SIA.5)

QUARTER 1		
Ohio Standards (2018)	**Student Learning Targets**	**Essential Investigations**
6.ESS.5: Rocks, minerals and soils have common and practical uses.	▪ Describe processes that change rock. (ESS.3)	

QUARTER 2		
Ohio Standards (2018)	**Student Learning Targets**	**Essential Investigations**
Earth and Space Science (ESS) **6.ESS.1:** Minerals have specific quantifiable properties. **6.ESS.2:** Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and classification. **6.ESS.3:** Igneous, metamorphic and sedimentary rocks form in different ways. **6.ESS.4:** Soil is unconsolidated material that contains nutrient matter and weathered rock. **6.ESS.5:** Rocks, minerals and soils have common and practical uses. **Physical Science (PS)** **6.PS.1:** Matter is made up of small particles called atoms. **6.PS.2:** Changes of state are explained by a model of matter composed of particles that are in motion. **6.PS.3:** There are two categories of energy: kinetic and potential. **6.PS.4:** An object's motion can be described by its speed and the direction in which it is moving.	▪ Describe factors that build soil. (ESS.4) ▪ Analyze soil samples and images to identify horizons within the soil. (ESS.4) ▪ Connect how the geography of a region affects properties of soil. (ESS.4) ▪ Recognize the characteristics of soil, rock and minerals to determine how they can be used. (ESS.5) ▪ Use physical and chemical properties to describe matter. (PS.1) ▪ Understand that matter cannot be created or destroyed. (PS.1) ▪ Create models of elements, compounds and molecules to show how they are connected. (PS.1) ▪ Explore, investigate and explain various types of potential and kinetic energy. (PS.3) ▪ Calculate an object's speed based on the amount of time it takes to travel a certain distance. (PS.4) ▪ Analyze and interpret graphs in order to describe an object's motion. (PS.4) ▪ Describe an object's motion in relation to a reference point. (PS.4)	▪ Composting Bottles (ESS.4, SIA.2) ▪ Soil Samples Investigations (Effects of Soil Choice) (ESS.4, ESS.5, SIA.6) ▪ Modeling Kinetic and Potential Energy (PS.3, SIA.5) ▪ Calculating the Speed of Various Objects (PS.4, SIA.4)

QUARTER 3		
Ohio Standards (2018)	**Student Learning Targets**	**Essential Investigations**
Physical Science (PS) **6.PS.1:** Matter is made up of small particles called atoms. **6.PS.2:** Changes of state are explained by a model of matter composed of particles that are in motion. **6.PS.3:** There are two categories of energy: kinetic and potential. **6.PS.4:** An object's motion can be described by its speed and the direction in which it is moving.	▪ Use physical and chemical properties to describe matter. (PS.1) ▪ Understand that matter cannot be created or destroyed. (PS.1) ▪ Create models of elements, compounds and molecules to show how they are connected. (PS.1) ▪ State that temperature is a measure of the average motion of the particles in a substance. (PS.2) ▪ Articulate that heat is a process of energy transfer and possible results of this transfer. (PS.2) ▪ Illustrate solids, liquids and gases in terms of motion of and spacing and attractions between particles. (PS.2) ▪ Explore, investigate and explain various types of potential and kinetic energy. (PS.3) ▪ Calculate an object's speed based on the amount of time it takes to travel a certain distance. (PS.4) ▪ Analyze and interpret graphs in order to describe an object's motion. (PS.4) ▪ Describe an object's motion in relation to a reference point. (PS.4)	▪ Using Mathematics and Tools to Describe Properties of Matter (PS.1, SIA.3) ▪ Rainbow Density Investigation (PS.1, SIA.2) ▪ Freezing-Melting Investigation (PS.2, SIA.6) ▪ Sublimation Investigation (PS.2, SIA.6) ▪ Condensation Investigation (PS.2, SIA.6)

QUARTER 4		
Ohio Standards (2018)	**Student Learning Targets**	**Essential Investigations**
Life Science (LS) **6.LS.1:** Cells are the fundamental unit of life. **6.LS.2:** All cells come from pre-existing cells. **6.LS.3:** Cells carry on specific functions that sustain life. **6.LS.4:** Living systems at all levels of organization demonstrate the complementary nature of structure and function.	▪ Explain how all living things are composed of cells. (LS.1) ▪ Identify the three major tenets of the Modern Cell Theory. (LS.2) ▪ Identify the specialized parts of plant and animal cells. (LS.3) ▪ Explain the function and coordination of cell components as well as their roles in overall cell function. (LS.3) ▪ Discuss the levels of cellular organization within plants and animals. (LS.4) ▪ Conclude that each type of cell, tissue, organ and organ system has a distinct structure and set of functions that serve the organism as a whole. (LS.4) ▪ Apply how organisms have diverse body plans, symmetry, and internal structures that contribute to being able to survive in their environments. (LS.4)	▪ Creating a Model of Plant Cell (LS.1, SIA.5) ▪ Creating a Model of Animal Cell (LS.1, SIA.5) ▪ Cell Types Investigation (LS.1, SIA.3) ▪ Cell Structure Investigation (LS.2, LS.3, SIA.3) ▪ Introduction to Microscopes (SIA.3) ▪ Microscopic Observations (SIA.3) ▪ Modern Cell Theory (LS.2, SIA.7)

District Instructional Resources:

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

Gizmos (online simulations) - https://www.explorelearning.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