Northern York County School District

Curriculum Overview

Course: 5th Grade Science	
Grade Level: 5	
Development/Revision Date: January 2025	**Length of Time:** 90 Days

Course Description:

Students will explore key concepts in Life Science, Physical Science, and Earth and Space Science through hands-on investigations, model-building, and data analysis. They will learn how plants grow by using air and water, trace the flow of matter through ecosystems, and discover the invisible particles that make up matter. Students will also examine physical and chemical changes, the effects of gravity, and how energy from the sun supports life.

In Earth and Space Science, students will explore the relationship between the brightness of stars and their distance from Earth, investigate how Earth's systems (geosphere, hydrosphere, biosphere, atmosphere) interact, and analyze the distribution of water on our planet. The course will also encourage students to think critically about current environmental issues and design solutions to protect Earth's resources. Through engaging activities, students will develop scientific reasoning and problem-solving skills to understand and apply science to the world around them.

Course Objectives:

Life Science

- Understand and explain how plants primarily obtain the materials needed for growth from air and water.
- Model the transfer of matter through ecosystems, showing how plants, animals, decomposers, and the environment interact.

Physical Science

- Explore and model how matter consists of particles that are too small to be seen.
- Use observations and measurements to identify and classify materials based on their properties.
- Analyze data to make informed decisions about the use of materials based on their characteristics.
- Measure and graph the total mass of substances to show that matter is conserved during physical and chemical changes.
- Conduct experiments to determine if mixing substances results in the formation of new materials.
- Explain and argue how Earth's gravity pulls objects downward.
- Model how the energy animals use for growth, repair, and movement originally comes from the sun.

Earth and Space Science

- Explain why the sun appears brighter than other stars, considering the distance of stars from Earth.
- Use graphs and data to demonstrate patterns in shadows, the cycle of day and night, and seasonal star visibility.
- Develop a model to explain how Earth's systems—geosphere, biosphere, hydrosphere, and atmosphere—interact with each other.
- Describe the distribution of Earth's water, including the amounts of fresh and salt water, and display this information using graphs.
- Gather information about how communities use science to conserve and protect Earth's resources.
- Design and propose solutions to current environmental challenges.

Related Standards:

Pennsylvania STEELS State Standards

Life Science

- **3.1.5.A** Support an argument that plants get the materials they need for growth chiefly from air and water.
- **3.1.5.B** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Physical Science

- **3.2.5.A** Develop a model to describe that matter is made of particles too small to be seen.
- **3.2.5.B** Make and communicate observations and measurements to identify materials based on their properties.
- **3.2.5.C** Interpret and analyze data to make decisions about how to utilize materials based on their properties.
- **3.2.5.D** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
- **3.2.5.E** Conduct an investigation to determine whether the mixing of two or more substances results in new substances
- **3.2.5.F** Support an argument that the gravitational force exerted by Earth on objects is directed down.
- **3.2.5.G** Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

Earth and Space Science

- **3.3.5.A** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
- **3.3.5.B** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
- **3.3.5.C** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- **3.3.5.D** Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- **3.3.5.E** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- **3.3.5.F** Generate and design possible solutions to a current environmental issue, threat, or concern.

Units:

- Earth's Place in the Universe
- Earth's Systems
- Living Interactions, Structure, and Energy

- Earth and Human Activity
- Matter and Its Interactions

Concepts:

- **STRUCTURES AND PROCESSES** - Plants acquire their material for growth chiefly from air and water.
- **INTERACTIONS, ENERGY, AND DYNAMICS** - Animal food sources come from plants, creating a food web with producers, consumers, and decomposers, where all species depend on each other in a balanced ecosystem that recycles matter.
- **MATTER AND ITS INTERACTIONS** - Matter is made up of tiny, invisible particles that can change form or combine to create new substances, but the total weight remains the same.
- **FORCES AND INTERACTIONS** - The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.
- **ENERGY** - The energy in food comes from the sun, captured by plants, and is used by animals for growth, repair, warmth, and movement.
- **EARTH'S PLACE IN THE UNIVERSE** - The sun looks bigger and brighter than other stars because it's closer, and its position, along with the Earth's rotation and orbit, creates patterns like day and night and changing shadows.
- **EARTH'S SYSTEMS** - Earth has four major systems that interact to shape the planet's surface, influence climate, and determine water distribution, with most water found in the oceans and most fresh water in glaciers or underground.
- **EARTH AND HUMAN ACTIVITY** - Human activities impact the environment, but people and communities are working to protect Earth's resources while matter cycles through air, soil, and living organisms.

Competencies:

- Demonstrate the ability to explain how matter is transported into, out of, and within different systems.
- Describe systems by identifying their components and analyzing the interactions among them.
- Classify and characterize natural objects across a range of sizes, from microscopic to astronomical.
- Accurately use standard units to measure and describe various physical quantities, including weight, time, temperature, and volume.
- Recognize and articulate consistent patterns that exist within natural systems, demonstrating an understanding of scientific principles.
- Identify and analyze cause and effect relationships to explain changes occurring in natural phenomena.
- Explain how energy can be transferred in various ways and between different objects, illustrating these processes with examples.
- Analyze similarities and differences in patterns to sort, classify, and communicate findings about rates of change in natural phenomena.
- Formulate scientific inquiries based on questions that can be investigated and answered through empirical evidence.

Learning Activities:

- Ask questions and define problems
- Plan and carry out investigations
- Engage in argument from evidence
- Develop and use models
- Analyze and interpret data

Performance Tasks:

- Formative lesson assessments such as student discussion, questioning, peer collaborative activities, reflections, teacher observations
- Summative unit assessments and projects

• Construct explanations and design solutions • Obtain, evaluate, and communicate information • Use math and computational thinking	
Other Assessment Measures: 5th Grade STEELS PSSA	
Textbook/Primary Resource: FOSS Next Generation	
Supplemental Resource Materials: Discovery Ed, Nearpod, BrainPop, Flocabulary, Seesaw, FOSS Thinklink, Edpuzzle, Youtube Science Videos	