

Wilson Area School District Planned Course Guide

Title of Planned Course: Fifth Grade Science

Subject Area: Science

Grade Level: Fifth Grade

Course Description: Students will explore scientific concepts in grade 5 that encourage critical and creative thinking in the Physical, Earth, and Life Sciences. Students will learn to develop testable questions and plan their own investigations.

Time/Credit for this Course: One Full Academic Year

Curriculum Writing Committee: Rosemarie Reider and Craig Burden

Curriculum Map

August: Physical Science (Properties and Changes of Matter)

September: Physical Science (Properties and Changes of Matter)

October: Earth Science (Biosphere, Geosphere, Hydrosphere and Atmosphere)
*Social Studies Curriculum

November: Earth Science (Biosphere, Geosphere, Hydrosphere and Atmosphere)
Earth Science (Water Cycle and Natural Resources)

December: Earth Science (Water Cycle and Natural Resources)
*Social Studies Curriculum

January: Earth Science (Water Cycle and Natural Resources)
Earth Science (Solar System)
*Social Studies Curriculum

February: Earth Science (Solar System)

March: Earth Science (Solar System)
*Social Studies Curriculum

April: Life Science (Energy and Food, Matter and Energy in Ecosystems)

May/June: Life Science (Energy and Food, Matter and Energy in Ecosystems)

Pennsylvania Integrated Standards for Science,
Environment, Ecology, Technology and Engineering

Grade 5

Physical Science

Matter and Its Interactions

1. Develop a model to describe that matter is made of particles too small to be seen.
2. 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. Make and communicate observations and measurements to identify materials based on their properties.
4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
5. Interpret and analyze data and observations to make decisions about how to utilize materials based on their properties.

Motion and Stability: Forces and Interactions

1. Support an argument that the gravitational force exerted by Earth on objects is directed down.

Energy

1. 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.

Grade 5

Earth and Space Sciences

Earth's Place in the Universe

1. Support an argument that differences in the apparent brightness of the sun compared to other stars are due to their relative distances from Earth.
2. 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.

Earth's Systems

1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Earth and Human Activity

1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
2. Generate and design possible solutions to a current environmental issue, threat, or concern.

Life Science

From Molecules to Organisms: Structures and Processes

1. Support an argument that plants get the materials they need for growth chiefly from air and water.

Ecosystems: Interactions, Energy, and Dynamics

1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Wilson Area School District Planned Course Materials

Course Title: Fifth Grade Science

Textbook: Elevate Science; Savvas 2019

Supplemental Resources:

Elevate Science: Videos, eText, Virtual Labs, online Vocabulary, and online review games and Quest-project based activities

Teacher Resources:

Savvas 5th Grade Elevate Science Digital Curriculum

<https://www.savvasrealize.com/dashboard/viewer>

Savvas Education Website

<https://www.savvas.com/index.cfm?locator=PS3eR5>

Study Island

<https://app.studyisland.com/cfw/login/>

Readworks

<https://www.readworks.org/>

Khan Academy

<https://www.khanacademy.org/>

HMH Into Reading-Reading Series

<https://www.hmhco.com/ui/login/>

Super Teacher

<http://www.superteacher.com>

Brain Pop

<http://www.brainpop.com>

Earth Science Resources ck-12

<http://www.ck12.org/earth-science>

NASA Earth Science Resources for Educators

<https://www.nasa.gov/stem/foreducators/k-12/index.html>

Science activities, games, and quizzes for kids

<http://www.sheppardsoftware.com>

Non-Fiction Science articles

<http://www.scholasticnews.com>

Radar's for Kids - All Science Concepts accessible from link

<http://www.chem4kids.com>

Curriculum Scope & Sequence

Planned Course: Fifth Grade Science

Unit: Physical Science (Topics 1-2)

Time Frame: 3 Weeks

Next Generation Science Standards: 5-PS1-1, 5-PS1-2, 5-PS1-3, 5-PS1-4, SEP.3, SEP.5, SEP.6,

Essential content/objectives: At the end of the unit, students will be able to:

- Describe some physical properties of matter.
- Relate the states of matter to temperature and the arrangement of movement of particles.
- Compare solids, liquids, gasses based on their physical properties.
- Explain that matter is made of atoms and describe the structure of an atom.
- Identify some elements and describe how elements differ from one another.
- Compare an element to a compound.

Core Activities: Students will complete/participate in the following:

- Quest Kickoff - Identify the Mystery Material
- Topic 1 - Lesson 1- Observe Matter
 - UInvestigate Lab - How do we describe materials?
 - Quest Check In - How can you observe matter?
- Topic 1 - Lesson 2 - Model Matter
 - Visual Literacy Connection - What is the Matter?
 - Quest Check In - How do you know that matter is still there?
 - Engineer It - Engineers that program robots to do tasks.
- Topic 1 - Lesson 3 - Properties of Matter
 - Quest Check In Lab - How can you compare the properties of matter?
 - Career Connection - Robotics Engineers
 - Demonstrate Lab - How do you know what it is?
- Topic 2 - Lesson 1- States of Matter
 - Visual Literacy Connection - What states of matter do you see?
- Topic 2 Lesson 2 - Physical Changes
 - UInvestigate Lab - Which properties are affected by temperature?
 - Quest Check In - Stepping Stone Properties
- Topic 2 - Lesson 3 - Chemical Changes
 - UInvestigate Lab - How can you identify chemical changes?
 - Engineer It - Foam Sweet Foam
- Topic 2 - Lesson 4 - Mixtures and Solutions
 - UInvestigate Lab - How can you separate a mixture?
 - Visual Literacy Connection - When is a mixture also a solution?
 - Career Connection - Materials Scientist

Extensions:

- Students will complete virtual labs and use online concepts provided by Elevate Science.
- Topic 1 - Lesson 1 - Connect Lab - What's in the box?
- Topic 1 - Lesson 2 - UInvestigate Lab - How can you detect matter without seeing it?
- Topic 1 - Lesson 3 - UInvestigate Lab - How can you use properties to identify solids?
- Topic 2 - Lesson 1 - STEM UConnect Lab - What happens to mass when objects are mixed?
- Topic 2 - Lesson 4 - Quest Check In - How can you make a new and improved formula?

Remediation:

- Re-read selection in small groups
- Modify tests and quizzes
- Differentiated student projects
- Interactive digital lessons and virtual labs
- Online support for vocabulary and concepts

Instructional Methods:

- Hands on exploration within cooperative learning groups
- Small and whole group instruction
- Direct instruction
- Modeling
- Project based learning and student research
- Research and note taking strategies using non-fiction articles and the internet.

Materials & Resources:

- Elevate Science; Savvas 2019
- [Elevate Science: Videos, eText, Virtual Labs, online Vocabulary, and online review games and Quest-project based activities](#)
- Fusion Science; Houghton Mifflin Science, 2012
- Teacher Made Materials
- [Study Island](#)
- [Khan Academy](#)

Assessments:

- Unit tests and quizzes
- Diagnostic pretests and open-ended responses
- Performance assessment
- Teacher observation
- Projects and reports
- Class discussion
- Daily Bell Ringers
- Self assessment

Curriculum Scope & Sequence

Planned Course: Fifth Grade Science

Unit: Earth's Systems (Topics 3 to 7)

Time Frame: 11 Weeks

Next Generation Science Standards: 5-ESS2-1, 5-ESS3-1, 5-ESS2-A, 5-ESS2-C, 5-ESS3-1, 5-ESS3-C, 5-ESS1-1, 5-ESS1-2, SEP.2, SEP.3, SEP.4, SEP.5, SEP.6, SEP.7, SEP.8

Essential content/objectives: Topic 3 - Earth's Systems: At the end of the unit, students will be able to:

- Describe what makes up the geosphere and biosphere.
- Describe what makes up the atmosphere and hydrosphere.
- Describe how Earth's systems interact with each other.

Core Activities: Topic 3 - Earth's Systems: Students will complete/participate in the following:

- Quest Kickoff - Connect the Spheres - How can acid rain affect Earth's spheres?
- Uconnect Lab - How can you model Earth?
- Literacy Connection - Cause and Effect
- Topic 3 - Lesson 1 - Geosphere and Biosphere
 - UInvestigate Lab - How does water move through soil?
 - Quest Check-in - Raining Acid
- Topic 3 - Lesson 2 - Hydrosphere and Atmosphere
 - Engineering Connection
 - UInvestigate Lab - How does a greenhouse work? Guided Inquiry
 - Visual Literacy Connection - What are parts of Earth's Hydrosphere?
- Topic 3 - Lesson 3 - Interactions Among Earth's Systems
 - Sports Connection
 - UInvestigate Lab - How does the geosphere affect the hydrosphere?
 - Interactions Among Earth's Spheres
 - Visual Literacy Connection - What are parts of Earth's Hydrosphere?
 - Quest Check-In - Earth Interactions
 - Stem Math Connection - Interpret a Graph
 - Quest Findings - Connect the Spheres
 - Career Connection - Air Pollution Analyst
 - UDemonstrate Lab - How does matter move through an ecosystem?

Essential content/objectives: Topic 4 - Earth's Water: At the end of the unit, students will be able to:

- Explore parts of the water cycle, and learn where solid, liquid, and water vapor can be found on Earth.
- Identify that most of the Earth's freshwater is in glaciers, ice caps, or underground.
- Explain that some freshwater is found in lakes, rivers, wetlands, and the atmosphere.
- Recognize that the ocean is an important part of the water cycle.
- Examine different characteristics of the oceans such as temperature, salinity, and ocean currents.

Core Activities: Topic 4 - Earth's Water: Students will complete/participate in the following:

- Quest Kickoff - Water. Water Everywhere! How can you make undrinkable water drinkable? - Water Quality Specialist Video
- Uconnect Lab - Where does water flow...and how fast?
- Literacy Connection - Draw Conclusions - Mystery of the Shrinking Lake
- Topic 4 - Lesson 1 - Water Cycle
 - Sports Connection - Winter Olympics - Making Snow
 - How does water cycle on Earth?
 - UInvestigate Lab - How does water move through soil?
 - Quest Check-in - Follow the Flow
 - UEngineer It! - It's Melting!
- Topic 4 - Lesson 2 - Earth's Freshwater
 - Local to Global Connection
 - Visual Literacy Connection - How is Freshwater Distributed Across Earth?
 - UBe a Scientist - Modeling Water Distribution & Model It!
 - Quest Check-in
- Topic 4 - Lesson 3 - Earth's Ocean
 - Local to Global Connection
 - UInvestigate Lab - How can you separate salt from water?
 - Visual Literacy Connection - What is the motion of the Ocean?
 - Quest Check-In - Water Resources
 - Solve it with Science - Can people live on Mars?
 - Quest Findings - How can you make undrinkable water drinkable?

Essential content/objectives: Topic 5 - Human Impacts on Earth's Systems: At the end of the unit, students will be able to:

- Topic 5 - Earth's Water
 - Explore parts of the water cycle, and learn where solid, liquid, and water vapor can be found on Earth.
 - Identify that most of the Earth's freshwater is in glaciers, ice caps, or underground. Explain that some freshwater is found in lakes, rivers, wetlands, and the atmosphere.
 - Examine different characteristics of the oceans such as temperature, salinity, and ocean currents.
- How can we protect Earth's resources and environments?
- Describe Earth's natural resources

Core Activities: Topic 5 - Human Impacts on Earth's Systems: Students will complete/participate in the following:

- Quest Kickoff - Take Care of Earth - It's Our Home!
 - Environmental Scientist Video
- Literacy Connection - Compare and Contrast - Using Energy Resources
- Topic 5 - Lesson 1 - Earth's Natural Resources
 - Local to Global Connection -
 - UInvestigate Lab - Where are the metals?
 - Quest Check-in - Efficient or Wasteful
 - UEngineer It! - Make Energy the Solar Way
- Topic 5 - Lesson 2 - Earth's Energy Resources
 - Engineering Connection
 - UInvestigate Lab - Which Color is Best at Capturing Solar Energy?

- Quest Connection
- Visual Literacy Connection - Where is Electrical Energy Generated?
- Quest Check-In - Save Energy!
- Topic 5 - Lesson 3 - Human Activity and Earth's Systems
 - Visual Literacy Connection - How can Human Activities Change Earth's Systems?
- Topic 5 - Lesson 4 - Protection of Earth's Resources and Environments
 - Curriculum Connection
 - Resource Protection and Environmental Conservation
 - Visual Literacy Connection - How do people recycle?
 - Quest Check-In - Increase Conversation
 - Extreme Science - 3, 2, 1 - Touchdown!
 - Quest Findings - Take Care of Earth - It's Our Home!
 - Career Connection - Environmental Scientist

Essential content/objectives: Topic 6 - Solar System: At the end of the unit, students will be able to:

- Recognize that many stars are as big and bright as the sun.
- Explain how the apparent brightness of stars is related to their distances from Earth.
- Describe and identify common characteristics of the inner planets of Mercury, Venus, Earth, and Mars.
- Recognize the position of Earth within the solar system.
- Describe and identify common characteristics of the outer planets of Jupiter, Saturn, Uranus, and Neptune.
- Recognize that there are moons, asteroids, and comets in our solar system.

Core Activities: Topic 6 - Solar System: Students will complete/participate in the following:

- Solar System - What is Earth's place in Space?
 - Quest Kickoff - Keeping the Planets in Order
 - Astronomical Technician Video
 - Literacy Connection - Use Text Features - A Very Old System
- Topic 6 - Lesson 1 - Brightness of the Sun and Other Stars
 - Local to Global Connection
 - UInvestigate Lab - How are distance and brightness related?
 - Synthesize Activity - Structure of the Sun - Online
 - Quest Check-In - Fun in the Sun!
- Topic 6 - Lesson 2 - Inner Solar System
 - Sports Connection
 - Visual Literacy Connection - What is in our Solar System?
 - Synthesize Activity - Structure of the Sun - Online
 - Quest Check-In - Fun in the Sun!
- Topic 6 - Lesson 3 - Outer Solar System
 - Curriculum Connection
 - Visual Literacy Connection - How are the Outer Planets Aligned?
 - Synthesize Activity - Structure of the Sun - Online
 - Quest Check-In - Fun in the Sun!
 - Stem Math Connection - How many Earths can line up across the Sun?
 - Quest Findings - Keeping the Planets in Order - How can you model your own solar system?
 - Career Connection - Astronomical Technicians

Essential content/objectives: Topic 7 - Patterns in Space: At the end of the unit, students will be able to:

- Demonstrate that Earth's gravity pulls objects toward the center of Earth
- Demonstrate that night and day are caused by the rotation of Earth around its axis once a day.
- Explain that Earth revolves around the sun about once a year.
- Describe why the amount of daylight is different depending on the time of year.
- Recognize the position of Earth within the solar system.
- Demonstrate why the sun, moon, and stars appear at different times.
- Describe why shadows change size and direction during the day.

Core Activities: Topic 7 - Patterns in Space: Students will complete/participate in the following:

- Patterns in Space - How do patterns change from day to day and season to season?
 - Quest Kickoff - Plan a Trip Around the World of Patterns
 - Literacy Connection - Sequence - Shadow Play
- Topic 7 - Lesson 1 - Earth's Gravitational Forces
 - Stem Connection
 - UInvestigate Lab - How long do objects take to fall?
 - Quest Check-In Lab - How does gravity affect matter? - Teacher model
 - Synthesize Activity - Structure of the Sun - Online
 - Quest Check-In - Fun in the Sun!
- Topic 7 - Lesson 2 - Earth's Movement in Space
 - Local to Global Connection
 - UInvestigate Lab - How are we spinning?
 - Visual Literacy Connection - What is the movement of Earth's moon in space?
 - Quest Check-In - Sun up, Sun Down
 - Stem Math Connection - How long does it take to orbit?
- Topic 7 - Lesson 3 - Patterns Over Time
 - Curriculum Connection
 - Visual Literacy Connection - How do we identify star patterns in the sky?
 - UEngineer it! Design - Coding Moon Phases
 - Career Connection - Planetarium Curator
 - UDemonstrate Lab - What can we tell from shadows?

Extensions: Earth's Systems - Topics 3 - 7

- Students will complete virtual labs and online concepts provided by Elevate Science.
- Teacher choice for extensions throughout Topics 3-7
 - UEngineer It! Labs
 - UInvestigate Labs
 - UConnect Labs

Remediation:

- Re-read selection in small groups
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- Differentiated student projects
- Interactive digital lessons and virtual labs
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Instructional Methods:

- Hands on exploration within cooperative learning groups
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- Project based learning and student research
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Assessments:

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- Performance assessment
- Teacher observation
- Projects and reports
- Class discussion
- Daily Bell Ringers
- Self assessment

Curriculum Scope & Sequence

Planned Course: Fifth Grade Science

Unit: Life Science (Topics 8 and 9)

Time Frame: 3 Weeks

Next Generation Science Standards: 5-PS3-1, 5-LS1-1, 5-LS2-1, 5-LS2-1, SEP.2, SEP.3, SEP.4, SEP.5, SEP.6, SEP.7, SEP.8

Essential content/objectives: At the end of the unit, students will be able to:

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

Core Activities: Students will complete/participate in the following:

- Quest Kickoff - Plan your plate! - Why do plants and animals need food?
- Topic 8 - Lesson 1 - Energy in Food -
 - UInvestigate Lab - How is the sun involved in your meals?
 - Energy in Food Chains - producers and consumers
- Topic 8 - Lesson 2 - How Plants Make Food
 - UEngineer It! - A Code for Plant Matter
- Topic 8 - Lesson 3 - How Animals Use Food
 - UInvestigate Lab - How do animals get energy from the sun?
 - Quest Check-in - Animals Using Energy
 - Extreme Science - The Hungriest Animals
 - Quest Findings - Plan your plate!
 - UDemonstrate Lab - How does matter move through an ecosystem?
- Topic 9 - Lesson 1 - Ecosystems - How do the parts of an Ecosystem work together?
 - Quest Kickoff - STEM - Public Relations Gone Wild!
 - StemUConnect Lab - How do the parts in a fish tank make up a system?
 - Compare & contrast - Bicycle Basics
 - UInvestigate Lab - How do the parts of an ecosystem work together?
 - Visual Literacy Connection - How do factors interact in a forest ecosystem?
- Topic 9 - Lesson 2 - Organisms Within Ecosystems
 - Visual Literacy Connection - Who eats whom?
 - Stem - Math Connection - Solving word problems
- Topic 9 - Lesson 3 - Change Within Ecosystems
 - Visual Literacy Connection - What happens to a forest ecosystem after a fire?
 - Quest Check-In Lab - How does change affect organisms in an ecosystem?
- Topic 9 - Lesson 4 - Matter and Energy Transfer Within Ecosystems
 - Visual Literacy Connection - How does carbon move through ecosystems?
 - Quest Check-In - Moving Matter and Energy
 - Career Connection - Zoologist

Extensions:

- Students will complete virtual labs, use labs and online concepts provided by Elevate Science.
- Topic 8 - Lesson 1- UInvestigate Lab - What matter do plants need to make food?
- Topic 8 - Lesson 2- Quest Check-In Lab - What plant foods provide the most energy and nutrients?
- Topic 9 - Lesson 1 - Quest Check-In - Unwelcome Inhabitants
- Topic 9 - Lesson 2 - UInvestigate Lab - How can matter change in an ecosystem?
- Topic 9 - Lesson 2 - Quest Check-In - Connections to Others
- Topic 9 - Lesson 3 - UInvestigate Lab - How does change affect organisms in an ecosystem?
- Topic 9 - Lesson 4 - Quest Findings - How can we improve public opinion of important, but disliked, animals?

Remediation:

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