

## Wilson Area School District Planned Course Guide

**Title of planned course:** Fourth Grade Science

**Subject Area:** Science

**Grade Level:** Fourth Grade

**Course Description:** This science curriculum will provide students with opportunities to become more self-directed, curious, and accountable. Students will synthesize ideas, use evidence, and demonstrate their understanding of key concepts and skills. Students will explore physical science, including energy and motion, human uses of energy, and waves and information. Students will explore Earth science including Earth's features, Earth's natural hazards, and the history of planet Earth. Students will explore life science including structures and functions, and human body systems.

**Time/Credit for this Course:** One Full Academic Year

**Curriculum Writing Committee:** Rayanne Parry and Lisa Herman

## Curriculum Map

### August/September:

- Topic 1: *Energy and Motion*: 24 days

### October/November:

- Topic 2: *Human Uses of Energy*: 30 days

### November/December:

- Topic 3: *Waves and Information*: 23 days

\*\* Finish Physical Science by end of December (77 days)\*\*

### January:

- Topic 4: *Earth's Features*: 22 days

### February:

- Topic 5: *Earth's Natural Hazards*: 20 days

### March:

- Topic 6: *The History of Planet Earth*: 18 days

\*\* Finish Earth Science by end of March (60 days)\*\*

### April/May/June:

- Topic 7: *Structures and Functions*: 17 days
- PSSAs: 6 days
- Topic 8: *Human Body Systems*: 13 days

\*\* Finish Life Science by end of May (30 days)\*\*

## Wilson Area School District Planned Course Materials

**Course Title:** Fourth Grade Science

**Textbook:** Elevate Science; Savvas 2019

**Teacher Resources:**

- Teacher Manual
- Student Edition Textbooks
- Lab Kits
- Videos
- SAVVAS Website
  - Online/Digital Resources
    - Professional Development Videos
    - Student eText
    - Synthesize Activities
    - Engineering Activities
    - Virtual Labs
    - Mini Games
    - Topic Tests
- Assessments
- Enrichment Activities

## Curriculum Scope & Sequence

**Planned Course:** Fourth Grade Science

**Unit:** Physical Science: Topic 1 - Energy and Motion

**Time frame:** 24 days

**State Standards:**

- 3.2.4.A: Use evidence to construct an explanation relating the speed of an object to the energy of that object.
- 3.2.4.B: Make and communicate observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
- 3.2.4.C: Ask questions and predict outcomes about the changes in energy that occur when objects collide.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.

**Essential content/objectives:** At end of Topic 1, students will be able to:

- Explain what energy is and describe some forms of energy.
- Explain how a moving object's speed and energy are related.
- Predict changes in energy that occur when objects collide.
- Give examples of energy being transferred from place to place.
- Explain that heat flows from hot objects to cold ones.
- Demonstrate that some materials are good conductors of heat and others are not.
- Use models to describe how electric currents flow through circuits.

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

- uConnect Lab; *How can you compare the energy of objects?*
- Lesson 1: *Energy Speed and Moving Objects*
  - including ulnvestigate Lab: *How does starting height affect an object's energy?*
- Lesson 2: *Collisions*
  - including ulnvestigate Lab: *How does energy transfer between objects?*
- Lesson 3: *Energy Transfer*
  - including ulnvestigate Lab: *How does heat move?*
- Lesson 4: *Electric Currents*
  - including ulnvestigate Lab: *How does electric energy flow in circuits?*

**Extensions:**

- Quest - Energy Changes in Collisions
- uEngineer It- Toys on the Move
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: “Support Advanced Learners” in teacher’s manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: “Support Struggling Students” in teacher’s manual
- Scaffolded Questions in teacher’s manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
- Hands-on activities and labs
- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

- Teacher Manual
- Student textbook
- Chromebooks
- Materials for labs
- Supplemental materials and worksheets
- SAVVAS website

**Assessments:**

- Class discussions
- Teacher observations
- Online Lesson Quizzes
- Lesson Checks in student textbook
- Topic Assessment (online and/or student textbook)
- Performance-Based Assessment: uDemonstrate Lab
- Teacher-created assessments

## Curriculum Scope & Sequence

**Planned Course:** Fourth Grade Science

**Unit:** Physical Science: Topic 2- Human Uses of Energy

**Time frame:** 30 days

**State Standards:**

- 3.2.4.D: Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
- 3.3.4.D: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 3.3.4.E: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
- 3.4.3-5.A: Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.
- 3.4.3-5.C: Examine ways you influence your local environment and community by collecting and displaying data.
- 3.4.3-5.D: Develop a model to demonstrate how local environmental issues are connected to larger local environment and human systems.
- 3.4.3-5.E: Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions.
- 3.4.3-5.G: Investigate how perspectives over the use of resources and the development of technology have changed over time and resulted in conflict over the development of societies and nations.
- 3.5.3-5.F: Classify resources used to create technologies as either renewable or nonrenewable.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.
- 3.5.3-5.FF: Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used.
- 3.5.3-5.GG: Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation.

**Essential content/objectives:** At end of Topic 2, students will be able to:

- Describe how natural resources are converted to energy and fuel.
- Investigate how people extract energy and use natural resources.
- Give examples of nonrenewable energy sources.
- Identify sources of nonrenewable energy.
- Distinguish between renewable and nonrenewable energy sources.
- Give examples of renewable energy sources.
- Describe how the use of different natural energy sources affects the local and global environments.
- Evaluate how technology can improve the environmental effects of using a given resource.

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

- uConnect Lab; *How are energy resources used?*
- Lesson 1: *Energy Conversions*
  - including ulnvestigate Lab: *How can a potato provide energy to a lightbulb?*
- Lesson 2: *Nonrenewable Energy Sources*
  - including ulnvestigate Lab: *How do we find oil?*
- Lesson 3: *Renewable Energy Sources*
  - including ulnvestigate Lab: *How does a windmill capture wind energy?*
- Lesson 4: *Environmental Impacts of Energy Use*
  - including ulnvestigate Lab: *Why is oil cleanup so hard?*
  - including video: “Environmental Impacts of Using Energy.”
  - including Interactivity: (online) “Human Activity and the Environment.”

**Extensions:**

- Quest - Power from the People
- uEngineer It- Hold That Phone
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: “Support Advanced Learners” in teacher’s manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: “Support Struggling Students” in teacher’s manual
- Scaffolded Questions in teacher’s manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
- Hands-on activities and labs
- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

- Teacher Manual
- Student textbook
- Chromebooks
- Materials for labs
- Supplemental materials and worksheets
- SAVVAS website

**Assessments:**

- Class discussions
- Teacher observations
- Online Lesson Quizzes
- Lesson Checks in student textbook
- Topic Assessment (online and/or student textbook)
- Performance-Based Assessment: uDemonstrate Lab
- Teacher-created assessments

## Curriculum Scope & Sequence

**Planned Course:** Fourth Grade Science

**Unit:** Physical Science: Topic 3- Waves and Information

**Time frame:** 23 days

### **State Standards:**

- 3.2.4.E: Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
- 3.2.4.F: Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
- 3.2.4.G: Generate and compare multiple solutions that use patterns to transfer information.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.

**Essential content/objectives:** At end of Topic 3, students will be able to:

- Describe the basic properties of waves, including how they move and transfer energy.
- Describe how waves can cause objects to move.
- Study patterns in wave characteristics.
- Differentiate between circular and plane waves.
- Model waves using patterns in wave properties.
- Study the electromagnetic spectrum and the properties of light waves.
- Observe how the eyes see color.
- Model how light reflection allows objects to be seen.
- Study radio waves and their characteristics.
- Observe how waves are transmitted through devices and radio wave systems.
- Demonstrate how high-tech devices use waves to send and receive information.

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

- uConnect Lab; *How do we describe waves?*
- Lesson 1: *Properties of Waves*
  - including ulnvestigate Lab: *How does a wave carry energy?*
- Lesson 2: *Patterns of Waves*
  - including ulnvestigate Lab: *What patterns can waves make?*
- Lesson 3: *Waves and the Electromagnetic Spectrum*
  - including ulnvestigate Lab: *How is light reflected?*
- Lesson 4: *Waves and Information*
  - including ulnvestigate Lab: *How can information from waves be translated?*

**Extensions:**

- Quest - Be a Message Master
- uEngineer It- Crack that Code
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: “Support Advanced Learners” in teacher’s manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: “Support Struggling Students” in teacher’s manual
- Scaffolded Questions in teacher’s manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
- Hands-on activities and labs
- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

- Teacher Manual
- Student textbook
- Chromebooks
- Materials for labs
- Supplemental materials and worksheets
- SAVVAS website

**Assessments:**

- Class discussions
- Teacher observations
- Online Lesson Quizzes
- Lesson Checks in student textbook
- Topic Assessment (online and/or student textbook)
- Performance-Based Assessment: uDemonstrate Lab
- Teacher-created assessments

## Curriculum Scope & Sequence

**Planned Course:** Science, Grade 4

**Unit:** Earth Science: Topic 4- Earth's Features

**Time frame:** 22 days

**State Standards:**

- 3.3.4.A: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
- 3.3.4.B: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- 3.3.4.C: Analyze and interpret data from maps to describe patterns of Earth's features.
- 3.5.3-5.A: Use appropriate symbols, numbers, and words to communicate key ideas about technological products and systems.
- 3.5.3-5.B: Examine information to assess the trade-offs to using a product or system.
- 3.2.4.G: Generate and compare multiple solutions that use patterns to transfer information.
- 3.4.3-5.A: Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.
- 3.4.3-5.B: Make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions
- 3.4.3-5.C: Examine ways you influence your local environment and community by collecting and displaying data.
- 3.4.3-5.D: Develop a model to demonstrate how local environmental issues are connected to larger local environment and human systems.
- 3.4.3-5.E: Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions.
- 3.4.3-5.F: Critique ways that people depend on and change the environment.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.
- 3.5.3-5.FF: Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used.
- 3.5.3-5.GG: Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation.
- 3.5.3-5.W: Describe the properties of different materials.

**Essential content/objectives:** At end of Topic 4, students will be able to:

- Explore different types of maps, use them to find information, and determine which map tools are the most helpful.
- Read maps to identify and compare the Earth's surface features.
- Use maps and models to explore how Earth's features are formed.
- Identify patterns in Earth's surface features.
- Identify characteristics of rocks and examine how they form.
- Explore and discover how rocks, minerals, and soil are related.
- Describe how rocks and soil form.
- Identify the properties of minerals.
- Explore chemical and physical weathering.
- Evaluate the relationship between weathering and erosion.
- Use evidence to show how weathering and erosion change the Earth's surface.

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

- uConnect Lab; *How can rain affect land?*
- Lesson 1: *Maps and Data*
  - including uInvestigate Lab: *How do tools help us?*
- Lesson 2: *Patterns of Earth's Features*
  - including uInvestigate Lab: *Where are major landforms?*
- Lesson 3: *Rocks, Minerals, and Soil*
  - including uInvestigate Lab: *How can you classify minerals?*
- Lesson 4: *Weathering and Erosion*
  - including uInvestigate Lab: *How can a rock wear away?*

**Extensions:**

- Quest - Does X Mark the Spot? That's up to you!
- uEngineer It- Take a Hike!
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: "Support Advanced Learners" in teacher's manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: "Support Struggling Students" in teacher's manual
- Scaffolded Questions in teacher's manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
- Hands-on activities and labs
- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

- Teacher Manual
- Student textbook
- Chromebooks
- Materials for labs
- Supplemental materials and worksheets
- SAVVAS website

**Assessments:**

- Class discussions
- Teacher observations
- Online Lesson Quizzes
- Lesson Checks in student textbook
- Topic Assessment (online and/or student textbook)
- Performance-Based Assessment: uDemonstrate Lab
- Teacher-created assessments

## Curriculum Scope & Sequence

**Planned Course:** Fourth Grade Science

**Unit:** Earth Science: Topic 5 - Earth's Natural Hazards

**Time frame:** 20 days

**State Standards:**

- 3.3.4.E: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
- 3.4.3-5.A: Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.
- 3.4.3-5.B: Make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions.
- 3.4.3-5.C: Examine ways you influence your local environment and community by collecting and displaying data.
- 3.4.3-5.D: Develop a model to demonstrate how local environmental issues are connected to larger local environment and human systems.
- 3.4.3-5.E: Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions.
- 3.4.3-5.F: Critique ways that people depend on and change the environment.
- 3.4.3-5.G: Investigate how perspectives over the use of resources and the development of technology have changed over time and resulted in conflict over the development of societies and nations.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.J: Explain how technologies are developed or adapted when individual or societal needs and wants change.
- 3.5.3-5.K: Judge technologies to determine the best one to use to complete a given task or meet a need.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.

**Essential content/objectives:** At end of Topic 5, students will be able to:

- Explore the causes and effects of tectonic hazards including earthquakes, volcanoes, and tsunamis.
- Describe how volcanic eruptions, earthquakes, and tsunamis can impact people.
- Study the causes and effects of weather-related hazards including blizzards, tornadoes, hurricanes, avalanches, landslides, floods, and drought.
- Describe how weather hazards can affect humans.
- Investigate and design possible solutions to minimize the impact of natural hazards.
- Explain how natural hazards can negatively affect humans.
- Describe some solutions that reduce the impact of natural hazards.

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

- uConnect Lab; *How can you reduce the impact of rapidly sliding soil?*
- Lesson 1: *Tectonic Hazards*
  - including uInvestigate Lab: *How can a large wave affect land?*
- Lesson 2: *Weather Hazards*
  - including uInvestigate Lab: *How does snow sliding quickly down a mountain impact people?*
- Lesson 3: *Impacts of Natural Hazards*
  - including uInvestigate Lab: *Where should you build an earthquake-safe structure?*

**Extensions:**

- Quest - Protect the City! Hazard incoming!
- uEngineer It- Warning!
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: “Support Advanced Learners” in teacher’s manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: “Support Struggling Students” in teacher’s manual
- Scaffolded Questions in teacher’s manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
- Hands-on activities and labs
- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

- Teacher Manual
- Student textbook
- Chromebooks
- Materials for labs
- Supplemental materials and worksheets
- SAVVAS website

**Assessments:**

- Class discussions
- Teacher observations
- Online Lesson Quizzes
- Lesson Checks in student textbook
- Topic Assessment (online and/or student textbook)
- Performance-Based Assessment: uDemonstrate Lab
- Teacher-created assessments

## Curriculum Scope & Sequence

**Planned Course:** Fourth Grade Science

**Unit:** Earth Science: Topic 6 - The History of Planet Earth

**Time frame:** 18 days

### **State Standards:**

- 3.2.4.G: Generate and compare multiple solutions that use patterns to transfer information.
- 3.3.4.A: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
- 3.4.3-5.A: Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.
- 3.4.3-5.B: Make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions.
- 3.4.3-5.C: Examine ways you influence your local environment and community by collecting and displaying data.
- 3.4.3-5.D: Develop a model to demonstrate how local environmental issues are connected to larger local environment and human systems.
- 3.4.3-5.E: Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions.
- 3.4.3-5.F: Critique ways that people depend on and change the environment.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.

**Essential content/objectives:** At end of Topic 6, students will be able to:

- Explore evidence of fossil patterns in layers of rock.
- Identify patterns in fossils and rock formations.
- Relate fossil patterns to environmental change and rock formations.
- Understand the forces that change layers of rock.
- Use patterns in fossils and rock formations to explain how a landscape has changed over time.

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

- uConnect Lab: *Where are fossils found in rock layers?*
- Lesson 1: *Patterns in Fossils and Rock Formations*
  - including ulInvestigate Lab: *What patterns do fossils follow?*
- Lesson 2: *Evidence of Change from Fossils and Rock Formations*
  - including ulInvestigate Lab: *How can rock layers show change?*

**Extensions:**

- Quest - Dig for the Truth
- uEngineer It- Making a Good Impression
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: “Support Advanced Learners” in teacher’s manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: “Support Struggling Students” in teacher’s manual
- Scaffolded Questions in teacher’s manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
- Hands-on activities and labs
- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

- Teacher Manual
- Student textbook
- Chromebooks
- Materials for labs
- Supplemental materials and worksheets
- SAVVAS website

**Assessments:**

- Class discussions
- Teacher observations
- Online Lesson Quizzes
- Lesson Checks in student textbook
- Topic Assessment (online and/or student textbook)
- Performance-Based Assessment: uDemonstrate Lab
- Teacher-created assessments

## Curriculum Scope & Sequence

**Planned Course:** Fourth Grade Science

**Unit:** Life Science: Topic 7 - Structures and Functions

**Time frame:** 17 days

**State Standards:**

- 3.1.4.A: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 3.1.4.B: Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- 3.4.3-5.A: Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.

**Essential content/objectives:** At end of Topic 7, students will be able to:

- Describe some internal plant structures that help plants survive and reproduce.
- Describe some external plant structures that help plants survive and reproduce.
- Describe some internal animal structures that help animals survive.
- Describe some external animal structures, such as skin and exoskeletons, that help animals survive and reproduce.
- Explore how organisms respond to the environment.
- Explain how animals use sensory information to respond to their environments.
- Describe how plants and animals can survive in different environments because of adaptations.

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

- uConnect Lab: *How do your eyes respond to differences in lighting?*
- Lesson 1: *Internal Structures and Functions of Plants*
  - including ulInvestigate Lab: *What parts are inside a flower?*
- Lesson 2: *External Structures and Functions of Plants*
  - including ulInvestigate Lab: *How are leaf coverings different?*
- Lesson 3: *Internal Structures and Functions of Animals*
  - including ulInvestigate Lab: *How can you compare the stomachs of cows and dogs?*
- Lesson 4: *External Structures and Functions of Animals*
  - including ulInvestigate Lab: *How can you design a protective insect shell?*

- Lesson 5: *Plant and Animal Responses to the Environment*
  - including ulInvestigate Lab: *How can you locate an object using only sound?*

**Extensions:**

- Quest - Let Plants and Animals Inspire You!
- uEngineer It- Eye See You!
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: “Support Advanced Learners” in teacher’s manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: “Support Struggling Students” in teacher’s manual
- Scaffolded Questions in teacher’s manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
- Hands-on activities and labs
- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

- Teacher Manual
- Student textbook
- Chromebooks
- Materials for labs
- Supplemental materials and worksheets
- SAVVAS website

**Assessments:**

- Class discussions
- Teacher observations
- Online Lesson Quizzes
- Lesson Checks in student textbook
- Topic Assessment (online and/or student textbook)
- Performance-Based Assessment: uDemonstrate Lab
- Teacher-created assessments

## Curriculum Scope & Sequence

**Planned Course:** Fourth Grade Science

**Unit:** Life Science: Topic 8 - Human Body Systems

**Time frame:** 13 days

**State Standards:**

- 3.1.4.A: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 3.1.4.B: Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond in different ways.
- 3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
- 3.5.3-5.M: Demonstrate essential skills of the engineering design process.
- 3.5.3-5.N: Identify why a product or system is not working properly.
- 3.5.3-5.O: Describe requirements of designing or making a product or system.
- 3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- 3.5.3-5.Q: Practice successful design skills.
- 3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
- 3.5.3-5.S: Illustrate that there are multiple approaches to design.
- 3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
- 3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.
- 3.5.3-5.CC: Describe how a subsystem is a system that operates as a part of another larger system.

**Essential content/objectives:** At end of Topic 8, students will be able to:

- Explore how human body systems are organized by cells, tissues, and organs.
- Explain how the heart helps move blood through the body.
- Explain how the circulatory and respiratory systems interact to move oxygen through the body.
- Understand the importance of the skeletal system for support and protection.
- Identify how the skin protects the body.
- Describe the functions of the skeleton, muscle, and skin.
- Explain how the skeletal and muscular systems interact to allow movement.
- Describe the functions of the brain and nervous system.
- Identify sensory organs and describe their functions.
- Relate the structures in the digestive, reproductive, and other systems to their functions.

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

- uConnect Lab: *Which body parts work together to do a task?*
- Lesson 1: *Circulatory and Respiratory Systems*
  - including ulnvestigate Lab: *How can you model how you breathe?*
- Lesson 2: *Skeleton, Muscles, and Skin*
  - including ulnvestigate Lab: *How can you test the strength of a bone?*
- Lesson 3: *Nervous System*
  - including ulnvestigate Lab: *Which parts of the body are more sensitive?*
- Lesson 4: *Digestive, Reproductive, and Other Systems*
  - including ulnvestigate Lab: *How are intestines arranged inside your body?*

**Extensions:**

- Quest - Make a Human Body Road Map
- uEngineer It- Pump It Up!
- Virtual Labs
- Online mini games
- Career Connection
- STEM activities
- STEM Engineering Readers (online)
- Engineering Connections
- Enrichment activities
- Teacher-created projects/ activities
- Differentiated Instruction strategies: “Support Advanced Learners” in teacher’s manual

**Remediation:**

- Reteach core concepts
- Differentiated Instruction strategies: “Support Struggling Students” in teacher’s manual
- Scaffolded Questions in teacher’s manual
- Remediation worksheets

**Instructional Methods:**

- Explicit Instruction
- Introduce vocabulary
- Read and discuss lessons in the textbook
- Complete questions, drawings, diagrams, and charts in the textbook
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- Whole group instruction
- Partner work
- Think-pair-share
- Online videos, resources, and learning games

**Materials & Resources:**

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**Assessments:**

- Class discussions
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