

Wallenpaupack Area School District

Planned Course Curriculum Guide

Department Science

Grades 3-5

Wallenpaupack Area School District Curriculum

COURSE: Grade 3-5 Science

GRADE/S: 3 –SE

UNIT: Fossils & Changing Environments

TIMEFRAME:

PA STEELS STANDARDS:

Grade 3 – 3.1.3.E (Life Science – Evidence of Common Ancestry and Diversity):

Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

Students will be able to analyze and interpret data from fossils to provide evidence of the organisms and environments in which they lived long ago

Students will be able to compare fossils from extinct animals to animals living today and use evidence to support arguments about the extinct animals

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Complete a simulated fossil dig and determine the changes to the environment over time based on the fossils in each layer of the earth (SE – 3)

Examine pictures of fossils and compare them to current animals to determine what extinct animals may have looked like and how they might have behaved (SE – 3)

Determine if students could outrun dinosaurs with similar leg lengths by measuring the distance of fossil footprints and the distance of each student’s stride (SE – 3)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments will focus on:

- Defining problems: Defining the criteria and constraints of a problem
- Modeling: Developing a model to generate data for testing and modifying a proposed solution
- Analyzing data: Analyzing data from tests to identify the best characteristics of each solution
- Using simulations: Using a simulation to model the impact of proposed solutions
- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

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|--|--------------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 3 –SE & NI |
| UNIT: Life Cycles | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 3 – 3.1.3.A (Life Science – Growth and Development of Organisms):

Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Grade 5 – 3.1.5.B (Life Science – Interdependent Relationships in Ecosystems):

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

Grade 3 – 3.1.3.H (Life Science – Biodiversity and Humans):

Make a claim supported by evidence about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

Students will be able to develop models to show and compare the life cycles of diverse plants and animals

Students will be able to use evidence to support claims about solutions in changing environments and the plants and animals that live there

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Create models that compare student's life cycles to those of other animals (SE – 3)

Examine the life cycle of mosquitoes and create/evaluate plans to help a town deal with its mosquito infestation. (SE – 3)

Model the Pollination of flowers (SE – 3)

Compare the outside and inside of scientific fruits and vegetables based to evaluate which fruits and vegetables are most closely related (SE – 3)

Model pollination of flowers over time and use evidence to predict how flowers and pollinators will change over generations (SE – 3)

Conduct a population study of Australian Eastern Grey Kangaroos to determine if the population is healthy (SE – 3)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

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- Using simulations: Using a simulation to model the impact of proposed solutions
- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

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|--|--------------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 3 –SE & NI |
| UNIT: Heredity, Survival, and Selection | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 3 – 3.1.3.C (Life Science – Inheritance of Traits):

Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

Grade 3 – 3.1.3.F (Life Science – Natural Selection):

Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

Grade 3 – 3.1.3.G (Life Science – Adaptation):

Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Grade 3 – 3.1.3.D (Life Science – Variation of Traits):

Use evidence to support the explanation that traits can be influenced by the environment.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

Students will be able to analyze and interpret data that shows that plants and animals have traits that are inherited from their parents and that variation of these traits is found in groups (SE – 3)

Students will be able to use evidence to show that plants and animals have traits that help them survive and thrive in their environment (SE – 3)

Students will be able to construct an argument with evidence that in a particular habitat some organisms thrive, some survive, and some cannot survive. (SE – 3)

Students will be able to construct an argument that animals have behavioral and physical adaptations that help them survive (SE – 3)

Students will be able to use evidence to support the explanation that traits can be influenced by the environment (SE – 3)

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Examine the leaves, flowers, and fruits of plants from other parts of the world with which students are probably unfamiliar and have them use evidence to determine whether they are related to plants they do know.

Analyze traits of dogs and pigeons and use evidence to model how designer breeds with specific traits can be created through artificial selection

Simulate the arrival of a predator species of lizard on an island can lead to changes in the native lizard population via natural selection

Examine the behaviors of different animals to determine how those behaviors help them survive

Analyze how astronaut bodies changed during their time in space and make predictions about how students' bodies and animals' bodies would change if they were sent to space.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

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- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|----------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 3 –SE - NI |
| UNIT: Weather and Climate | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 3 – 3.3.3.A (Earth & Space Science – Weather and Climate):

Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

Grade 3 – 3.3.3.B (Earth & Space Science – Weather and Climate):

Obtain and combine information to describe climates in different regions of the world.

Grade 3 – 3.3.3.C (Earth & Space Science – Natural Hazards):

Make a claim supported by evidence about the merit of a design solution that reduces the impacts of a weather-related hazard.

Grades 3–5 – 3.4.3–5.E (Environmental Literacy & Sustainability – Environmental Literacy Skills):

Use inquiry and critical thinking skills to investigate environmental issues.

Grades 3–5 – 3.4.3–5.F (Environmental Literacy & Sustainability – Investigating Environmental Issues):

Research local or global environmental issues and suggest possible solutions.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

Students will be able to show data to describe typical weather conditions expected during a particular season.

Students will be able to analyze information to describe climates in different regions of the world.

Students will be able to design solutions based on evidence that reduces the impact of weather-related hazards.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Identify types of clouds and predict weather based on cloud type and wind direction (SE – 3)

Analyze historical weather data to predict conditions in the future (SE – 3)

Color in a map of climate zones on Earth and use it to identify patterns (SE – 3)

Engineer a house that could withstand a hurricane by building models and testing them with a fan (SE – 3)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

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DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|----------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 3 –SE - NI |
| UNIT: Forces, Motion, and Magnets | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 3 – 3.2.3.B (Physical Science – Forces and Motion):

Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

Grade 3 – 3.2.3.A (Physical Science – Forces and Motion):

Make and communicate observations and/or measurements of an object’s motion to provide evidence that a pattern can be used to predict future motion.

Grade 3 – 3.2.3.C (Physical Science – Types of Interactions):

Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

Grade 3 – 3.2.3.D (Physical Science – Types of Interactions):

Define a simple design problem that can be solved by applying scientific ideas about magnets.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

Grades 3–5 – 3.5.3-5.GG (Continuous Improvement):

Use feedback and iterative processes to improve technological products, processes, or systems.

Grades 3–5 – 3.5.3-5.HH (Lifelong Learning):

Understand and articulate the importance of lifelong learning in technology and engineering fields to adapt to advances.

UNIT OBJECTIVES (SWBATS):

Students will be able to plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object

Students will be able to observe and/or measure of an object's motion and use evidence to predict the object's future motion

Students will be able to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

Students will be able to design a solution to a problem that can be solved with magnets

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Design a way to use balanced and unbalanced forces to win a game of tug-of-war against stronger opponents (SE – 3)

Use the design process to engineer bridges that can hold increased loads (SE – 3)

Build models of moving objects and make predictions about future motion (SE – 3)

Conduct controlled experiments that determine if increased mass or a steeper ramp will make a matchbox car go further (SE – 3)

Conduct investigations to explore the properties of magnets (SE – 3)

Design a simple magnetic lock for a door (SE – 3)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

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DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|---|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (both schools) – SE & NI in science, NI in health class |
| UNIT 1: Human Body Systems and the Brain | TIMEFRAME: |

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| <p>PA STEELS STANDARDS:</p> <p>Grade 4 – 3.1.4.A (Life Science – Structure and Function): <i>Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</i></p> <p>Grade 4 – 3.1.4.B (Life Science – Information Processing): <i>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.</i></p> <p>Grade 4 – 3.2.4.F (Physical Science – Electromagnetic Radiation): <i>Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.</i></p> <p>Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking): <i>Describe requirements of designing or making a product or system.</i></p> <p>Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking): <i>Demonstrate essential skills of the engineering design process.</i></p> <p>Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking): <i>Evaluate designs based on criteria, constraints, and standards.</i></p> <p>Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking): <i>Practice successful design skills.</i></p> |
| <p>UNIT OBJECTIVES (SWBATS):</p> <ul style="list-style-type: none"> • Students will be able to explain structures and functions of the human body. |

- Students will be able to model how our bones and muscles are interconnected, how our eyes interact with light and impact our vision, and how our brain responds to stimuli in our environment.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Create a model of a human finger to show how tendons, muscles and bones interact (SE – 4)
- Create a model of an eye to show the function of the cornea, retina, and pupil (SE – 4)
- Add descriptions and labels to a model to show how the brain shares and receives messages to respond to stimuli (SE – 4)
- Model the basic structure and function of plant and animal cells and their organelles (NI – 5)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments will focus on:

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- Using simulations: Using a simulation to model the impact of proposed solutions

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|--------------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (SE), 5 (NI) |
| UNIT 1: Earth's Features and Processes | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 4 – 3.3.4.B (Earth & Space Science – Earth Materials and Systems):

Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Grade 4 – 3.3.4.E (Earth & Space Science – Natural Hazards):

Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

Grade 5 – 3.3.5.C (Earth & Space Science – Earth Materials and Systems):

Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

Grade 4 – 3.3.4.C (Earth & Space Science – Plate Tectonics and Large-Scale System Interactions):

Analyze and interpret data from maps to describe patterns of Earth's features.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process. ing)

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

Grades 3–5 – 3.5.3–5.BB (Technology & Engineering – Ethics in Technology Use):

Discuss ethical considerations in the use and development of technology.

Grades 3–5 – 3.5.3–5.CC (Technology & Engineering – Sustainability in Technology):

Consider and explain how technology choices affect sustainability.

Grades 3–5 – 3.5.3–5.DD (Technology & Engineering – Resource Use in Technology):

Recognize how resource use and management affect technology and the environment.

Grades 3–5 – 3.5.3–5.EE (Technology & Engineering – Collaboration in Engineering):

Work collaboratively to solve a technical problem.

Grades 3–5 – 3.5.3–5.FF (Technology & Engineering – Innovation):

Identify and support innovative ideas/solutions in technology and engineering.

UNIT OBJECTIVES (SWBATS):

- Students will be able to model Earth processes of weathering and erosion
- Students will be able to apply their knowledge and design solutions to mitigate the impacts of these processes on humans
- Students will be able to describe the rock cycle
- Students will understand the relationship between volcanoes and continental plate movements

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Create models for earthquakes, volcanoes/lava, continental plate movement (SE – 4, NI - 5)
- Model weathering and erosion to create sediment (SE – 4, NI - 5)
- Develop solutions so that structures can withstand natural disasters (SE – 4, NI - 5)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

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- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|----------------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (both schools) |
| UNIT 1: Energy and Energy Transfer | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 4 – 3.2.4.A (Physical Science – Definitions of Energy):

Use evidence to construct an explanation relating the speed of an object to the energy of that object.

Grade 4 – 3.2.4.C (Physical Science – Relationship Between Energy and Forces):

Ask questions and predict outcomes about the changes in energy that occur when objects collide.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

- Students will be able to design investigations of how energy is stored and how it can make objects move
- Students will build simulations to show how collisions transfer energy between objects

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Design one-step machines that transfer potential to kinetic energy (SE – 4)
- Identification of simple machines in use (NI – 4)
- Create solutions to problems using simple machines (NI – 4)
- Design a chain reaction machine (Rube Goldberg machine) to show how energy can be transferred (SE – 4)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

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DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|----------------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (both schools) |
| UNIT 1: Electricity, Heat, and Light | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 4 – 3.2.4.B (Physical Science – Conservation of Energy and Energy Transfer):

Make and communicate observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

Grade 4 – 3.2.4.D (Physical Science – Energy in Chemical Processes and Everyday Life):

Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

Grades 3–5 – 3.5.3–5.GG (Continuous Improvement):

Use feedback and iterative processes to improve technological products, processes, or systems.

UNIT OBJECTIVES (SWBATS):

- Students will be able to design circuits with switches, bulbs, and wires to solve problems
- Students will be able to describe how types of energy can be converted into other types of energy (wind, solar, heat, electricity, motion etc.)

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Discussion of insulators and conductors (Both – 4)
- Design of simple and parallel circuits to solve problems (Both – 4)
- Model how types of energy can be transferred into other types of energy (SE – 4)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

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DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|--------------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 3 (NI), 5 (SE) |
| UNIT 1: Ecosystems and Food Webs | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 5 – 3.1.5.B (Life Science – Interdependent Relationships in Ecosystems):

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

Grade 5 – 3.1.5.A (Life Science – Organization for Matter and Energy Flow in Organisms):

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

Grade 5 – 3.1.3.H (Life Science – Biodiversity and Humans):

Make a claim supported by evidence about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Grade 5 – 3.3.5.C (Earth & Space Science – Earth Materials and Systems):

Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

Grades 3–5 – 3.4.3–5.A (Environmental Literacy & Sustainability – Agricultural and Environmental Systems):

Describe and compare different agricultural and environmental systems.

Grades 3–5 – 3.4.3–5.B (Environmental Literacy & Sustainability – Agricultural Systems):

Explain how agricultural systems impact the environment

Grades 3–5 – 3.4.3–5.D (Environmental Literacy & Sustainability – Watersheds and Wetlands):

Identify features and functions of watersheds and wetlands and describe their importance.

Grades 3–5 – 3.4.3–5.E (Environmental Literacy & Sustainability – Environmental Literacy Skills):

Use inquiry and critical thinking skills to investigate environmental issues.

Grades 3–5 – 3.4.3–5.F (Environmental Literacy & Sustainability – Investigating Environmental Issues):

Research local or global environmental issues and suggest possible solutions.

Grades 3–5 – 3.4.3–5.G (Environmental Literacy & Sustainability – Evaluating Solutions):

Evaluate different solutions to environmental problems, considering sustainability and impact.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

Grades 3–5 – 3.4.3-5.A (Agricultural and Environmental Systems and Resources – Agricultural Systems):

Develop a model to describe how agricultural and food systems function, including sustainable use of natural resources, and production, processing, and management of food, fiber, and energy.

Grades 3-5 - 3.4.3-5.A (Agricultural and Environmental Systems and Resources – Agricultural Systems):

Develop a model to describe how agricultural and food systems function, including sustainable use of natural resources, and production, processing, and management of food, fiber, and energy.

Grades 3-5 - 3.4.3-5.B (Environmental Literacy – Environment and Society):

Analyze and interpret data about how different societies and cultures use and manage natural resources differently.

UNIT OBJECTIVES (SWBATS):

- Students will be able to identify producers and consumers in an ecosystem

- Students will be able to explain the role of photosynthesis in using energy from the Sun to sustain almost all life on Earth

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Create food chains and food webs for different environments (NI – 3, SE – 5)
- Model decomposition of matter in an ecosystem (beetles – NI - 3, compost bins/garden - SE - 5)
- Create a solution for the introduction of an invasive species (NI - 3)
- Evaluate impact of environmental changes on a food web/ecosystem (SE -5)
- Model the carbon cycle and use it and climate data to explain fossil fuels and the impact of their use (SE – 5)
- Conduct a simulated cleanup of an oil spill and evaluate possible solutions (SE –5)
- Plan gardening activities for the year, germinate seeds indoors (both indoor greenhouse and in windowsills), transplant seeds to garden, tend the garden during the school year, and harvest crops when mature (SE – 3, 4, and 5)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

- Defining problems: Defining the criteria and constraints of a problem
- Modeling: Developing a model to generate data for testing and modifying a proposed solution
- Analyzing data: Analyzing data from tests to identify the best characteristics of each solution
- Evaluating solutions: Evaluating solutions based on criteria and trade-offs
- Using simulations: Using a simulation to model the impact of proposed solutions
- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

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| KEY VOCABULARY: |

| Wallenpaupack Area School District Curriculum | |
|--|--------------------------------------|
| COURSE: Grade 3-5 Science | GRADE/S: 3/4/5 (SE), 3/4 (NI) |
| UNIT 1: Water Cycle and Earth's Systems | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 5 – 3.3.5.D (Earth & Space Science – The Role of Water in Earth's Surface Processes):

Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Grade 5 – 3.3.5.F (Earth & Space Science – Human Impact on Earth Systems):

Generate and design possible solutions to a current environmental issue, threat, or concern.

Grade 5 – 3.3.5.E (Earth & Space Science – Human Impact on Earth Systems):

Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Grade 4 – 3.3.4.B (Earth Materials and Systems):

Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Grades 3–5 – 3.4.3–5.D (Environmental Literacy & Sustainability – Watersheds and Wetlands):

Identify features and functions of watersheds and wetlands and describe their importance.

Grades 3–5 – 3.4.3–5.F (Environmental Literacy & Sustainability – Investigating Environmental Issues):

Research local or global environmental issues and suggest possible solutions.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

Grades 3–5 – 3.5.3–5.B (Technology & Engineering – Impacts of Technology):

Examine information to assess the trade-offs to using a product or system.

Grades 3–5 – 3.5.3–5.F (Technology & Engineering – Sustainability in Technology):

Classify resources used to create technologies as either renewable or nonrenewable.

Grades 3–5 – 3.5.3–5.L (Technology & Engineering – Applying, Maintaining, and Assessing Technological Products and Systems):

Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.

Grades 3–5 – 3.5.3–5.N (Technology & Engineering – Design Thinking):

Identify why a product or system is not working properly.

Grades 3–5 – 3.5.3–5.T (Technology & Engineering – Design Thinking):

Apply universal principles and elements of design.

Grades 3–5 – 3.5.3–5.V (Technology & Engineering – Design Thinking):

Interpret how good design improves the human condition.

Grades 3–5 – 3.5.3–5.AA (Technology & Engineering – History of Technology):

Create representations of the tools people made, how they cultivated to provide food, made clothing, and built shelters to protect themselves.

Grades 3–5 – 3.5.3–5.FF (Technology & Engineering – Innovation):

Identify and support innovative ideas/solutions in technology and engineering.

3.4.3-5.C (Environmental Literacy – Watersheds and Wetlands):

Develop a model to describe how watersheds and wetlands function as systems, including roles and services they provide.

3.4.3-5.D (Environmental Literacy – Environmental Justice):

Explore how environmental decisions affect communities differently, including issues of equity, justice, and human health.

UNIT OBJECTIVES (SWBATS):

- Students will be able to model how water moves through Earth’s systems
- Students will be able to develop solutions to issues that affect human societies
- Students will be able to describe the movement and impact of water on our community

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Model water cycle with evaporation, precipitation, condensation, and transpiration (SE - 3, both *w/ Lacawac* 4th)
- Conduct a macroinvertebrate study of local ponds and streams (Both – 5th, SE – 4th)
- Graph the amount of salt, fresh, and frozen water on Earth (5th)
- Discuss solutions to issues of water shortage in a community (SE – 5th)
- Model the movement of water through food chains (NI – 3rd)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

- Defining problems: Defining the criteria and constraints of a problem
- Modeling: Developing a model to generate data for testing and modifying a proposed solution
- Analyzing data: Analyzing data from tests to identify the best characteristics of each solution

- Evaluating solutions: Evaluating solutions based on criteria and trade-offs
- Using simulations: Using a simulation to model the impact of proposed solutions
- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

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| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (NI), 5 (SE) |
| UNIT 1: Earth and Space Patterns | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 4 – 3.3.4.C (Earth & Space Science – Plate Tectonics and Large-Scale System Interactions):

Analyze and interpret data from maps to describe patterns of Earth’s features.

Grade 5 – 3.3.5.B (Earth & Space Science – Earth and the Solar System):

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.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

- Students will be able to explain patterns of the Earth, Sun, Moon, and stars.

- Students will be able to describe why shadows change throughout the day, how the Sun's position changes throughout the year, and how stars in the sky change throughout the seasons.
- Students will be able to create Earth, Sun, and Moon models to explore Moon patterns.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Create models of moon phases (NI – 4)
- Model Earth/Sun/Moon relationship (NI – 4, SE – 5)
- Use a student created sun dial to analyze patterns with shadows at different times of the day. (SE – 5)
- Determine what constellations will be in the sky using a model of the Earth and Sun. (SE – 5)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

- Defining problems: Defining the criteria and constraints of a problem
- Modeling: Developing a model to generate data for testing and modifying a proposed solution
- Analyzing data: Analyzing data from tests to identify the best characteristics of each solution
- Evaluating solutions: Evaluating solutions based on criteria and trade-offs
- Using simulations: Using a simulation to model the impact of proposed solutions
- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

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| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (NI), 5 (SE) |
| UNIT 1: Stars and Planets | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 5 – 3.3.5.A (Earth & Space Science – The Universe and Its Stars):

Support an argument that differences in the apparent brightness of the Sun compared to other stars is due to their relative distances from Earth.

Grade 5 – 3.2.5.F (Physical Science – Types of Interactions):

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

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

- Students will be able to explain the relative brightness of the Sun by describing how it appears from each planet in our solar system
- Students will be able to calculate the differences of gravity on Earth with gravity on other planets and discover patterns.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Model how the brightness of a light source changes with distance (SE – 5)
- Complete a table showing the gravitational force on different planets in the solar system (NI - 4, SE – 5)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

- Defining problems: Defining the criteria and constraints of a problem
- Modeling: Developing a model to generate data for testing and modifying a proposed solution
- Evaluating solutions: Evaluating solutions based on criteria and trade-offs
- Using simulations: Using a simulation to model the impact of proposed solutions
- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
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| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (NI), 5 (SE) |
| UNIT : Chemical Reactions and Properties of Matter | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 5 – 3.2.5.A (Physical Science – Structure and Properties of Matter):

Develop a model to describe that matter is made of particles too small to be seen.

Grade 5 – 3.2.5.B (Physical Science – Structure and Properties of Matter):

Make and communicate observations and measurements to identify materials based on their properties.

Grade 5 – 3.2.5.C (Physical Science – Structure and Properties of Matter):

Interpret and analyze data to make decisions about how to utilize materials based on their properties.

Grade 5 – 3.2.5.D (Physical Science – Chemical Reactions):

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.

Grade 5 – 3.2.5.E (Physical Science – Chemical Reactions):

Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.P (Technology & Engineering – Design Thinking):

Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

UNIT OBJECTIVES (SWBATS):

Students will be able to explain the three states of matter on Earth and their qualities

Students will be able to describe properties of matter

Students will be able to measure acids and bases

Students will be able to explain the difference between chemical reactions and physical changes to matter.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Demonstrate physical state changes in water and how mass remains the same in a closed system (NI – 4, SE – 3)
- Web quest – states of matter (NI – 4)
- Build models of molecules (NI – 4, SE – 5)
- Student experiments to determine the impact of different substances on pennies (copper oxide) (SE –5)
- Conduct experiments to measure the how the pH of a substance changes when acids react with bases (SE – 5)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

- Defining problems: Defining the criteria and constraints of a problem
- Modeling: Developing a model to generate data for testing and modifying a proposed solution
- Analyzing data: Analyzing data from tests to identify the best characteristics of each solution
- Evaluating solutions: Evaluating solutions based on criteria and trade-offs
- Using simulations: Using a simulation to model the impact of proposed solutions

- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY:

| | |
|--|------------------------|
| Wallenpaupack Area School District Curriculum | |
| COURSE: Grade 3-5 Science | GRADE/S: 4 (SE) |
| UNIT : Sound Waves and Communication | TIMEFRAME: |

PA STEELS STANDARDS:

Grade 4 – 3.2.4.E (Wave Properties):

Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

Grade 4 – 3.2.4.G (Information Technologies and Instrumentation):

Generate and compare multiple solutions that use patterns to transfer information.

Grades 3–5 – 3.5.3–5.O (Technology & Engineering – Design Thinking):

Describe requirements of designing or making a product or system.

Grades 3–5 – 3.5.3–5.M (Technology & Engineering – Design Thinking):

Demonstrate essential skills of the engineering design process.

Grades 3–5 – 3.5.3–5.U (Technology & Engineering – Design Thinking):

Evaluate designs based on criteria, constraints, and standards.

Grades 3–5 – 3.5.3–5.Q (Technology & Engineering – Design Thinking):

Practice successful design skills.

Grades 3–5 – 3.5.3–5.Y (Technology & Engineering – Integration of Knowledge):

Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.

Grades 3–5 – 3.5.3-5.GG (Continuous Improvement):

Use feedback and iterative processes to improve technological products, processes, or systems.

UNIT OBJECTIVES (SWBATS):

Students will be able to describe how vibrations and patterns allow us to communicate across distances.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

Use morse code to send messages to others via vibration and light flashes

Build devices to allow sound waves to travel over distance

Use recycled materials to build a new instrument in which wavelength and amplitude can be changed.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Assessments for this unit will focus on:

- Defining problems: Defining the criteria and constraints of a problem
- Modeling: Developing a model to generate data for testing and modifying a proposed solution
- Evaluating solutions: Evaluating solutions based on criteria and trade-offs
- Using simulations: Using a simulation to model the impact of proposed solutions
- Computational thinking: Using a problem-solving process to think logically and break down steps to solve a problem

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

RESOURCES (Technology Based Resources, Text Resources, etc.):

KEY VOCABULARY: