

Wallenpaupack Area School District

Wallenpaupack Area North Primary and South Elementary

Course Title: Grade Four Elementary Science

Length of Course: 120 minutes per week

District Policies:

Academic Integrity:

Academic integrity is essential to the success of an educational community. Students are responsible for learning and upholding professional standards of research, writing, assessment, and ethics in their areas of study. Written or other work which students submit must be the product of their own efforts and must be consistent with appropriate standards of professional ethics. Academic dishonesty, which includes cheating, plagiarism, multiple submissions and other forms of dishonest or unethical behavior, is prohibited.

Assessment:

The goal of grading is to report student progress and achievement to the parents to strengthen the home-school connection. The grade should accurately reflect the student's performance in mastering the PA Standards and the WASD curriculum.

Attendance:

Regular school attendance is vitally important to academic success. Not only does attendance reinforce and enrich the learning process; it also establishes patterns and attitudes that will carry forward into adult work habits. Regular, consistent attendance is a prerequisite to successful school life. Children should be absent only in cases of illness or emergency.

Special Education:

Our commitment to each student is to ensure a free appropriate public education which begins with the general education setting, with the use of Supplementary Aids and Services. Inclusive education describes the successful education of all students with the appropriate supports and services to participate in and benefit from the general classroom settings and other educational environments.

Course Description:

The elementary science curriculum provides opportunities for students to develop understanding and skills to become problem solvers in a scientific world. Students will explore, measure, manipulate, describe and identify matter and its changing states. Students will differentiate between chemical and physical change. Students will investigate and manipulate magnets while engaging in labs, identifying variables and interpreting data. They will also investigate, identify and create parallel and series circuits. Seasons and movement within our solar system will be predicted and described. Students will develop an understanding of the elements of weather, weather patterns and factors that effect weather conditions.

Physical Science: Matter, Properties
of Matter and Interactions between
Matter

[3.2.3.A1](#)

Differentiate between properties of objects such as size, shape, and weight and properties of materials that make up the objects such as color, texture, and hardness.

Differentiate between the three states of matter, classifying a substance as a solid, liquid, or gas.

[3.2.3.A2](#)

Recognize that all objects and materials in the world are made of matter.

[3.2.3.A3](#)

Demonstrate how heating and cooling may cause changes in the properties of materials including phase changes.

[3.2.3.A4](#)

Use basic reactions to demonstrate observable changes in properties of matter (e.g., burning, cooking).

[3.2.3.A5](#)

CONSTANCY AND CHANGE Recognize that everything is made of matter.

[3.2.4.A1](#)

Identify and classify objects based on their observable and measurable physical properties.

Compare and contrast solids, liquids, and gases based on their properties.

[3.2.4.A2](#)

Demonstrate that materials are composed of parts that are too small to be seen without magnification.

[3.2.4.A3](#)

Demonstrate the conservation of **mass** during physical changes such as melting or freezing.

[3.2.4.A4](#)

Recognize that combining two or more substances may make new materials with different properties.

[3.2.4.A5](#)

MODELS

Use models to demonstrate the physical change as water goes from liquid to ice and from liquid to vapor.

[3.2.5.A1](#)

Describe how water can be changed from one state to another by adding or taking away heat.

[S3.C.1.1.1](#)

Describe matter in terms of its observable properties (e.g., weight, mass, shape, size, color, texture, state).

[S3.C.1.1.2](#)

Classify matter using observable physical properties (e.g., weight, mass, shape, size, color, texture, state).

S3.C.1.1.3

Classify a substance as a solid, liquid, or gas.

S3.C.1.1.4

Recognize and identify how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).

S3.C.1.1.5

Describe how the properties of matter can be changed (e.g., heating, cooling, and physical weathering).

S3.C.2.1.1

Identify basic forms and sources of energy (e.g., Sun, heat, light, sound).

S3.C.2.1.2

Identify simple transformations of energy (e.g., eating food to get energy, rubbing hands together to create heat).

S3.C.2.1.3

Identify characteristics of sound (i.e., pitch, and loudness).

S4.A.1.3.1

Observe and record change by using time and measurement.

S4.A.1.3.2

Describe relative size, distance, or motion.

S4.A.1.3.3

Observe and describe the change to objects caused by temperature change or light.

S4.A.3.1.1

Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).

S4.A.3.2.1

Identify what different models represent (e.g., maps show physical features, directions, distances; globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps show relationships of ideas).

S4.A.3.2.2

Use models to make observations to explain how systems work (e.g., water cycle, Sun-Earth-Moon system).

S4.A.3.2.3

Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two cans and string to model a communications system, terrarium to model an ecosystem).

S4.C.1.1.1

Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter.

S4.C.1.1.2

Categorize/group objects using physical characteristics.

S5.C.1.1.1

Identify characteristic properties of matter that are independent of mass and volume.

[S5.C.1.1.2](#)

Differentiate between volume and mass.

[S5.C.1.2.1](#)

Describe how water changes from one state to another.

[S5.D.1.2.1](#)

Identify physical, chemical, and biological factors that affect water quality.

[S5.D.2.1.1](#)

Explain how the cycling of water into and out of the atmosphere impacts climatic patterns.

[S5.D.2.1.2](#)

Explain the effects of oceans and lakes on climate.

Physical Science: Magnetism and Electricity

[3.2.3.B2](#)

Explore energy's ability to cause motion or create change.

Explore how energy can be found in moving objects, light, sound, and heat.

[3.2.3.B3](#)

Explore temperature changes that result from the addition or removal of heat.

[3.2.3.B4](#)

Identify and classify objects and materials that are conductors or insulators of electricity.

Identify and classify objects and materials as magnetic or non-magnetic.

[3.2.3.B5](#)

Recognize that light travels in a straight line until it strikes an object or travels from one material to another

[3.2.3.B6](#)

ENERGY Recognize that light from the sun is an important source of energy for living and nonliving systems and some source of energy is needed for all organisms to stay alive and grow.

[3.2.4.B2](#)

Identify types of energy and their ability to be stored and changed from one form to another.

[3.2.4.B3](#)

Understand that objects that emit light often emit heat.

[3.2.4.B4](#)

Apply knowledge of basic electrical circuits to the design and construction of simple direct **current** circuits.

Compare and contrast series and parallel circuits.

Demonstrate that magnets have poles that repel and attract each other.

3.2.4.B5

Demonstrate how vibrating objects make sound and sound can make things vibrate.

Demonstrate how light can be reflected, refracted, or absorbed by an object.

3.2.4.B6

ENERGY

Give examples of how energy can be transformed from one form to another.

3.2.5.B2

Examine how energy can be transferred from one form to another.

3.2.5.B3

Demonstrate how heat energy is usually a byproduct of an energy transformation.

3.4.4.E3

Identify types of energy and the importance of energy conservation.

S3.C.1.1.1

Describe matter in terms of its observable properties (e.g., weight, mass, shape, size, color, texture, state).

S3.C.1.1.2

Classify matter using observable physical properties (e.g., weight, mass, shape, size, color, texture, state).

S3.C.1.1.3

Classify a substance as a solid, liquid, or gas.

S3.C.1.1.4

Recognize and identify how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).

S3.C.1.1.5

Describe how the properties of matter can be changed (e.g., heating, cooling, and physical weathering).

S3.C.2.1.1

Identify basic forms and sources of energy (e.g., Sun, heat, light, sound).

S3.C.2.1.2

Identify simple transformations of energy (e.g., eating food to get energy, rubbing hands together to create heat).

S3.C.2.1.3

Identify characteristics of sound (i.e., pitch, and loudness).

S3.C.3.1.1

Identify and describe an object's motion (e.g., start/stop, push/pull, up/down, left/right, faster/slower, spinning).

S3.C.3.1.2

Describe an object's position in terms of its relationship to another object or stationary background (e.g., behind, beside, on top of, above, below).

S4.A.1.1.1

Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results (e.g., a scientific fact can be supported by making observations).

S4.A.1.1.2

Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, and packaging materials) that have either positive or negative impacts on society or the environment.

S4.A.1.3.1

Observe and record change by using time and measurement.

S4.A.1.3.2

Describe relative size, distance, or motion.

S4.A.1.3.3

Observe and describe the change to objects caused by temperature change or light.

S4.A.3.1.1

Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).

S4.C.2.1.1

Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical).

S4.C.2.1.2

Describe the flow of energy through an object or system (e.g., feeling radiant heat from a light bulb, eating food to get energy, using a battery to light a bulb or run a fan).

S4.C.2.1.3

Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches.

S4.C.2.1.4

Identify characteristics of sound (e.g., pitch, loudness, reflection).

S4.C.3.1.1

Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).

S4.C.3.1.2

Compare the relative movement of objects or describe types of motion that are evident (e.g., bouncing ball, moving in a straight line, back and forth, merry-go-round).

S4.C.3.1.3

Describe the position of an object by locating it relative to another object or a stationary background (e.g., geographic direction, left, up).

S5.C.2.1.1

Describe how energy exists in many forms (e.g., electrical, mechanical, chemical, heat, light, sound) and can be transformed within a system.

S5.C.2.1.2

Describe how heat energy is usually a byproduct of an energy transformation.

Earth Science: Weather Systems and Water Cycle

S5.C.2.1.3

Distinguish between kinetic and potential energy.

S5.C.2.1.4

Explain how energy is conserved.

S5.C.3.1.1

Differentiate between the mass and weight of an object.

S5.C.3.1.2

Explain how the mass of an object resists change to motion (inertia).

S5.C.3.2.1

Recognize that moving electric charges produce magnetic forces and moving magnets produce electric forces (electromagnetism).

S5.C.3.2.2

Identify the variables within an electric current (i.e., voltage, current, and resistance).

3.3.3.A4

Connect the various forms of precipitation to the weather in a particular place and time.

3.3.3.A5

Explain how air temperature, moisture, wind speed and direction, and precipitation make up the weather in a particular place and time.

3.3.4.A4

Recognize Earth's different water resources, including both fresh and saltwater.

Describe phase changes in the forms of water on Earth.

3.3.4.A5

Describe basic weather elements.

Identify weather patterns over time.

3.3.4.A6

MODELS/SCALE

Identify basic landforms using models and simple maps.

CONSTANCY/ CHANGE

Identify simple changes in the earth **system** as air, water, soil and rock interact.

SCALE

Explain how basic weather elements are measured.

3.3.5.A4

Explain the basic components of the water cycle.

3.3.5.A5

Differentiate between weather and climate.

Explain how the cycling of water, both in and out of the atmosphere, has an effect on climate

4.2.3.A

Define the term **watershed**.

- Identify the **watersheds** in which you reside.

4.2.4.A

Describe the physical characteristics of a **watershed**.

- Identify and explain what determines the boundaries of a **watershed**.

- Identify water systems and their components as either **lotic** or **lentic**.

4.2.5.A

Explain the **water cycle**.

S3.D.1.1.1

Recognize that rock is composed of different kinds of minerals.

S3.D.1.3.1

Identify ways that cause Earth's surface to be constantly changing (e.g., wind and water erosion, contraction and expansion of surfaces).

S3.D.1.3.2

Distinguish between ways that tear down the surface of Earth and those that build up the surface (e.g., erosion, weathering, volcanic activity, earthquakes).

S3.D.1.3.3

Distinguish between slow and rapid changes to Earth's surface (i.e., rapid [earthquakes, volcanic activity]; slow [weathering, erosion]).

S3.D.2.1.1

Recognize that clouds have different characteristics that relate to different weather conditions.

S3.D.2.1.2

Describe how weather variables (i.e., temperature, wind speed, wind direction, and precipitation) are observed and measured.

S3.D.2.1.3

Identify appropriate instruments to study and measure weather elements (i.e., thermometer [temperature]; wind vane [wind direction]; anemometer [wind speed]; rain gauge [precipitation]).

S4.A.3.1.1

Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).

S4.A.3.2.1

Identify what different models represent (e.g., maps show physical features, directions, distances; globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps show relationships of ideas).

S4.A.3.2.2

Use models to make observations to explain how systems work (e.g., water cycle, Sun-Earth-Moon system).

S4.A.3.2.3

Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two cans and string to model a communications system, terrarium to model an ecosystem).

S4.A.3.3.1

Identify and describe observable patterns (e.g., growth patterns in plants, weather, and water cycle).

S4.A.3.3.2

Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, and lunar phases).

S4.C.1.1.1

Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter.

S4.C.1.1.2

Categorize/group objects using physical characteristics.

S4.D.1.3.1

Describe types of freshwater and saltwater bodies (e.g., lakes, rivers, wetlands, oceans).

S4.D.1.3.2

Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).

S4.D.1.3.4

Explain the role and relationship of a watershed or a wetland on water sources (e.g., water storage, groundwater recharge, water filtration, water source, water cycle).

S4.D.2.1.1

Identify basic cloud types (i.e., cirrus, cumulus, stratus, and cumulonimbus) and make connections to basic elements of weather (e.g., changes in temperature, precipitation).

S4.D.2.1.2

Identify weather patterns from data charts or graphs of the data (e.g., temperature, wind direction, wind

	speed, cloud types, precipitation). <u>S4.D.2.1.3</u> Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, anemometer, and barometer) to study weather and what they measure. <u>S5.C.1.2.1</u> Describe how water changes from one state to another. <u>S5.C.1.2.2</u> Identify differences between chemical and physical changes of matter. <u>S5.D.1.1.1</u> Differentiate between abrupt changes in Earth's surface (e.g., earthquakes, volcanoes, meteor impacts, landslides) and gradual changes in Earth's surface (e.g., lifting up of mountains, wearing away by erosion). <u>S5.D.2.1.1</u> Explain how the cycling of water into and out of the atmosphere impacts climatic patterns. <u>S5.D.2.1.2</u> Explain the effects of oceans and lakes on climate.
Earth and Space Science: Solar System	<u>3.3.3.B1</u> Relate the rotation of the earth and day/night, to the apparent movement of the sun, moon, and stars across the sky. Describe the changes that occur in the observable shape of the moon over the course of a month. <u>3.3.4.B1</u> Identify planets in our solar system and their basic characteristics. Describe the earth's place in the solar system that includes the sun (a star), planets, and many moons. Recognize that the universe contains many billions of galaxies and that each galaxy contains many billions of stars. <u>3.3.4.B2</u> <u>SCALES</u> Know the basic characteristics and uses of telescopes.

PATTERNS/PHASES

Identify major lunar phases.

PATTERNS

Explain time (days, seasons) using **solar system** motions.

3.3.5.B1

Provide evidence that the earth revolves around (orbits) the sun in a year's time and that the earth rotates on its axis once approximately every 24 hours.

S3.D.3.1.1

Describe how Earth rotates on its axis once every 24 hours giving rise to the cycle of night and day.

S3.D.3.1.2

Describe the predictable patterns of change that occur over time in the observable shape of the Moon.

S4.A.3.1.1

Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).

S4.A.3.3.1

Identify and describe observable patterns (e.g., growth patterns in plants, weather, and water cycle).

S4.A.3.3.2

Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, and lunar phases).

S4.D.2.1.1

Identify basic cloud types (i.e., cirrus, cumulus, stratus, and cumulonimbus) and make connections to basic elements of weather (e.g., changes in temperature, precipitation).

S4.D.2.1.2

Identify weather patterns from data charts or graphs of the data (e.g., temperature, wind direction, wind speed, cloud types, precipitation).

S4.D.2.1.3

Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, anemometer, and barometer) to study weather and what they measure.

S4.D.3.1.1

Describe motions of the Sun - Earth - Moon system.

S4.D.3.1.2

Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years).

S4.D.3.1.3

Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis.

	<u>S5.D.3.1.1</u> Describe the patterns of Earth’s rotation and revolution in relation to the Sun and Moon (i.e., solar eclipse, phases of the Moon, and time). <u>S5.D.3.1.2</u> Compare the general characteristics of the inner planets of our solar system (i.e., size, orbital path, surface characteristics, and moons). <u>S6.D.2.1.1</u> Describe cloud types and measurable factors (i.e., wind direction, temperature, barometric pressure, moisture, and precipitation) that are associated with various weather patterns. <u>S6.D.2.1.2</u> Interpret weather data to develop a weather forecast. <u>S6.D.2.1.3</u> Explain how global patterns (jet stream, water currents) influence weather immeasurable terms (e.g., wind direction, temperature, barometric pressure, precipitation). <u>S6.D.3.1.1</u> Compare the size and surface features of the planets that comprise the solar system as well as the objects orbiting them. <u>S6.D.3.1.2</u> Describe how the size, composition, and surface features of the planets are influenced by their distance from the Sun.
Standards Incorporated in All Grade levels	<u>3.4.4.A1</u> Understand that tools, materials, and skills are used to make things and carry out tasks. <u>3.4.4.A2</u> Understand that systems have parts and components that work together. <u>3.4.3.B1</u> Describe how using technology can be good or bad. <u>3.4.3.B3</u> Identify and define products made to meet individual needs versus wants. <u>3.4.3.B4</u> Illustrate how people have made tools to provide food, clothing, and shelter. <u>3.4.4.B2</u> Explain how the use of technology affects the environment in good and bad ways. <u>3.4.4.C3</u> Explain how asking questions and making observations help a person understand how things work and can be repaired. <u>3.4.4.D2</u> Recognize and use everyday symbols (e.g. icons, simple electrical symbols measurement) to communicate

key ideas.

Identify and use simple hand tools (e.g., hammer, scale) correctly and safely.

S3.A.1.1.1

Distinguish between fact and opinion.

S3.A.1.1.2

Identify examples of common technological changes, past and present, in the community (e.g., energy production, transportation, communication, recycling).

S3.A.2.2.1

Identify appropriate tools or instruments for specific tasks, and describe the information they provide (i.e., measuring [length—ruler; mass— balance scale] and making observations [hand lenses—very small objects]).

S3.D.1.2.1

Describe why certain resources are renewable and other resources are nonrenewable.

S3.D.1.2.2

Identify and describe examples of renewable and nonrenewable resources.

S3.D.1.2.3

Describe the ways living things benefit from the uses of water resources.

S4.A.1.1.1

Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results (e.g., a scientific fact can be supported by making observations).

S4.A.1.1.2

Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, and packaging materials) that have either positive or negative impacts on society or the environment.

S4.A.1.3.1

Observe and record change by using time and measurement.

S4.A.1.3.2

Describe relative size, distance, or motion.

S4.A.1.3.3

Observe and describe the change to objects caused by temperature change or light.

S4.A.2.1.1

Generate questions about objects, organisms, or events that can be answered through scientific investigations.

S4.A.2.1.2

Design and describe an investigation (a fair test) to test one variable.

S4.A.2.1.3

Observe a natural phenomenon (e.g., weather changes, length of daylight/night, and movement of shadows,

animal migrations, and growth of plants), record observations, and then make a prediction based on those observations.

S4.A.2.1.4

State a conclusion that is consistent with the information/data.

S4.A.2.2.1

Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length - ruler, mass - balance scale, volume - beaker, temperature - thermometer; making observations: hand lens, binoculars, and telescope).

S4.A.3.1.1

Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).

S4.B.3.3.1

Identify everyday human activities (e.g., driving, washing, and eating, manufacturing, farming) within a community that depend on the natural environment.

S4.B.3.3.4

Identify major land uses in the urban, suburban and rural communities (e.g., housing, commercial, recreation).

S4.B.3.3.5

Describe the effects of pollution (e.g., litter) in the community.

Course Objectives:
Students will demonstrate the ability to:

-

Students will master the skills of:

-

Major Activities to Support Course Objectives:

Student Responsibilities:
Attendance expectations:

Homework expectations:

Make-Up Work:

Late Work:

Assessment:
Grading Components:

Content Pacing Guide:

Topic	Major Assignments	Estimated Time