Curriculum Map: Science 4th Grade 2020-21

Course: Science4 Sub-topic: General

Grade(s): 4

Course Description: Fourth Grade Students who take this course will acquire scientific concepts and principles in the following four areas: The Nature of Science, Biological Sciences, Physical Sciences, and Earth and Space Sciences. Students will meet the Pennsylvania State Standards in Science by learning content and investigating the world around them. In this course, the students will build balloon cars, dissect owl pellets, use weather instruments, build circuits, make magnets and electromagnets, attend presentations and use chrome technology.

Course Textbooks, Workbooks, Materials Citations: Textbook: Harcourt School Publishers. (2009) Harcourt Inc.

Pacing Calendar: One Academic Calendar Year

Course Interdisciplinary Connections: ELA(English and Language Arts) is incorporated daily in 4th grade Science Lessons. Students write essays based on activities completed or principles learned. Students write out lab forms, learn and apply new vocabulary terms.

Math is incorporated daily in 4th grade Science Lessons. Students take measurements and make calculations. They use tables and graphs to look at data and information.

Course Notes: 4th Grade Science Teams up with The Bradford County Conservation District for Monthly Presentations. Envirothon Science Competition. Agricultural Field Day. Field Trip to Troy Farm Museum. Claverac Rural Electric Company does a Safety Program for our 4th grade students. Mrs. Card runs a Sick Science Program which supplements our Science Curriculum. We use IXL a computer based learning program.

Unit: Tools of Science/ Scientific Method

Timeline: Week 1 to 3

Unit Description: Plan and conduct a simple investigation and understand that different questions require different kinds of investigations.

Use simple equipment (tools and other technologies) to gather data and understand that this allows scientists to collect more information than relying only on their senses to gather information.

Unit Essential Questions: Which tools of science would be most appropriate to use for inquiry?

Unit Big Ideas: Evaluate appropriate methods and/or tools for collecting data.

Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.

Make predictions about what would happen if a variable changes.

Collect data about the performance of a proposed object, tool, process or system under a range of conditions.

Unit Materials: Harcourt 4th Grade Science Textbook

Various Tools of Science

Unit Test

Unit Assignments:

Science Notes

Read Lessons

Scientific Method Experiment

Type 2 Writing Essay

Unit Test

Unit Key Terminology & Definitions:

Analyze

Features

Interpret

Microscope

Telescope

Barometer

Anemometer

Hand Lense

Scale

Standard Measure

Rain Guage

Observe

Inference

Hypothesis

Variable

Conclusion

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.A.2 (Advanced)	Processes, Procedures, and Tools of Scientific Investigations
S4.A.2.1 (Advanced)	Apply skills necessary to conduct an experiment or design a solution to solve a problem.
S4.A.2.1.1 (Advanced)	Generate questions about objects, organisms, or events that can be answered through scientific investigations.
S4.A.2.1.2 (Advanced)	Design and describe an investigation (a fair test) to test one variable.
S4.A.2.1.3 (Advanced)	Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations.
S4.A.2.1.4 (Advanced)	State a conclusion that is consistent with the information/data.
S4.A.2.2 (Advanced)	Identify appropriate instruments for a specific task and describe the information the instrument can provide.
S4.A.2.2.1 (Advanced)	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, telescope).

Topic: Tools and Safety

Minutes for Topic: 45

Topic: Scientific Method
Minutes for Topic: 45

Topic: Scientific Fact vs Opinion
Minutes for Topic: 45

Unit: Weather and Climate

Timeline: Week 4 to 9

Unit Description:

Identify basic weather conditions and how they are measured.

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).

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

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

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

Describe phase changes in the forms of water on Earth.

Describe basic weather elements.

Identify weather patterns over time.

Unit Essential Questions:

How and why is Earth constantly changing?

How do Earth's processes and human activities affect each other?

Unit Big Ideas:

The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.

The Earth's processes affect and are affected by human activities.

Unit Materials:

Harcourt Science 4th Grade Textbook

Science Notebook

Weather Tools

Poster Paper

Unit Assignments:

Science Notes

Water Cycle Poster

Cloud Foldable

Type 2 Writing Essay

Unit Test

Unit Key Terminology & Definitions:

Evaporation

Condensation

Precipitation

Ground Water

Stratus

Cumulus

Cumulonimbus

Cirrus

Thermometer

Barometer

Anemometer

Wind Vane

Rain Gauge

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.A.3.2.1 (Advanced)	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 (Advanced)	Use models to make observations to explain how systems work (e.g., water cycle, Sun-Earth-Moon system).
S4.D.1.3 (Advanced)	Describe Earth's different sources of water or describe changes in the form of water.
S4.D.1.3.1 (Advanced)	Describe types of freshwater and saltwater bodies (e.g., lakes, rivers, wetlands, oceans).
S4.D.1.3.2 (Advanced)	Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).
S4.D.1.3.3 (Advanced)	Describe or compare lentic systems (i.e., ponds, lakes, and bays) and lotic systems (i.e., streams, creeks, and rivers).
S4.D.1.3.4 (Advanced)	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 (Advanced)	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 (Advanced)	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 (Advanced)	Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, anemometer, and barometer) to study weather and what they measure.

Topic: The Water Cycle

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.1 (Advanced)	Earth Features and Processes that Change Earth and Its Resources
S4.D.1.1.1 (Advanced)	Describe how prominent Earth features in Pennsylvania (e.g., mountains, valleys, caves, sinkholes, lakes, rivers) were formed.
S4.D.1.1.2 (Advanced)	Identify various Earth structures (e.g., mountains, watersheds, peninsulas, lakes, rivers, valleys) through the use of models.
S4.D.1.3 (Advanced)	Describe Earth's different sources of water or describe changes in the form of water.
S4.D.1.3.1 (Advanced)	Describe types of freshwater and saltwater bodies (e.g., lakes, rivers, wetlands, oceans).
S4.D.1.3.4 (Advanced)	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).

Topic: Types of Clouds

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.1.3 (Advanced)	Describe Earth's different sources of water or describe changes in the form of water.
S4.D.1.3.2 (Advanced)	Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).
S4.D.2 (Advanced)	Weather, Climate, and Atmospheric Processes
S4.D.2.1.1 (Advanced)	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).

Topic: Weather Instruments

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.2.1.3 (Advanced)	Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, anemometer, and barometer) to study weather and what they measure.

Topic:

Unit: Ecosystems/Life Science

Timeline: Week 9 to 12

Unit Description:

Describe the different resources that plants and animals need to live.

Identify differences in the life cycles of plants and animals.

Describe plant and animal adaptations that are important to survival.

Describe features that are observable in both parents and their offspring.

Recognize that reproduction is necessary for the continuation of life.

Identify different characteristics of plants and animals that help some populations survive and reproduce in greater numbers.

Describe how environmental changes can cause extinction in plants and animals.

Describe plant and animal adaptations that are important to survival.

Unit Essential Questions:

How do organisms live, grow, respond to their environment, and reproduce?

How and why do organisms interact with their environment and what are the effects of these interactions?

How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?

Unit Big Ideas:

All organisms are made of cells and can be characterized by common aspects of their structure and functioning

Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.

Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.

Unit Materials: Harcourt Science 4th Grade Textbook

Dan Rhodes: Conservation Officer/ Bradford County

Materials to Grow Plants

Materials for Owl Pellet Dissection Lab

Poster

Unit Assignments: Read Lessons

Science Notes

Food Chain Poster

Life Cycle Project

Owl Pellet Dissection Lab

Type 2 Writing

Unit Test

Unit Key Terminology & Definitions: Ecosystem

Environment

Abiotic

Biotic

Predator

Prey

Niche

Consumer

Decomposer

Carnivore

Herbivore

Omnivore

Adaptations

Genetics

Heredidity

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.B.1.1.3 (Advanced)	Describe basic needs of plants and animals (e.g., air, water, food).
S4.B.1.1.4 (Advanced)	Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).
S4.B.3.1.1 (Advanced)	Describe the living and nonliving components of a local ecosystem (e.g., lentic and lotic systems, forest, cornfield, grasslands, city park, playground).
S4.B.3.1.2 (Advanced)	Describe interactions between living and nonliving components (e.g. plants – water, soil, sunlight, carbon dioxide, temperature; animals – food, water, shelter, oxygen, temperature) of a local ecosystem.
S4.B.3.2 (Advanced)	Describe, explain, and predict change in natural or human-made systems and the possible effects of those changes on the environment.

Topic: Basic Needs

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.B.1.1 (Advanced)	Identify and describe similarities and differences between living things and their life processes.
S4.B.1.1.1 (Advanced)	Identify life processes of living things (e.g., growth, digestion, respiration).
S4.B.1.1.3 (Advanced)	Describe basic needs of plants and animals (e.g., air, water, food).
S4.B.1.1.4 (Advanced)	Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).

Topic: Abiotic and Biotic Factors in an Ecosystem

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.B.1.1 (Advanced)	Identify and describe similarities and differences between living things and their life processes.
S4.B.1.1.1 (Advanced)	Identify life processes of living things (e.g., growth, digestion, respiration).
S4.B.1.1.4 (Advanced)	Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).
S4.B.3.1 (Advanced)	Identify and describe living and nonliving things in the environment and their interaction.
S4.B.3.1.1 (Advanced)	Describe the living and nonliving components of a local ecosystem (e.g., lentic and lotic systems, forest, cornfield, grasslands, city park, playground).
S4.B.3.1.2 (Advanced)	Describe interactions between living and nonliving components (e.g. plants – water, soil, sunlight, carbon dioxide, temperature; animals – food, water, shelter, oxygen, temperature) of a local ecosystem.

Topic: Food Chains/ Food Webs

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.A.3.1.2 (Advanced)	Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium).

Topic: Adaptations

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.B.1.1.4 (Advanced)	Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).
S4.B.2.1 (Advanced)	Identify and explain how adaptations help organisms to survive.
S4.B.2.1.1 (Advanced)	Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).

Topic: Life Cycles of Plants and Animals

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.A.3.3.1 (Advanced)	Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).
S4.B.1.1 (Advanced)	Identify and describe similarities and differences between living things and their life processes.
S4.B.1.1.1 (Advanced)	Identify life processes of living things (e.g., growth, digestion, respiration).
S4.B.1.1.4 (Advanced)	Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).
S4.B.3.2.1 (Advanced)	Describe what happens to a living thing when its habitat is changed.

S4.B.3.2.3 (Advanced)	Explain and predict how changes in seasons affect plants, animals, or daily human life (e.g., food availability, shelter, mobility).

Topic: Heredity

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.B.2.2 (Advanced)	Identify that characteristics are inherited and, thus, offspring closely resemble their parents.
S4.B.2.2.1 (Advanced)	Identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring.

Unit: Changes to Earth's Surface

Timeline: Week 13 to 17

Unit Description:

Describe basic landforms.

Identify the layers of the earth.

Recognize that the surface of the earth changes due to slow processes and rapid processes.

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

Identify basic properties and uses of Earth's materials including rocks, soils, water, and gases of the atmosphere.

Unit Essential Questions:

What is the universe, and what is Earth's place in it?

How and why is Earth constantly changing?

How do Earth's processes and human activities affect each other?

Unit Big Ideas:

The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws

The Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.

The Earth's processes affect and are affected by human activities.

Unit Materials:

Harcourt Science 4th Grade Textbook

Science Journal

Dan Rhodes/ Bradford County Conservation District

Weathering/ Erosion Model

Globe/Layers of Earth Models

Unit Assignments:

Read Lessons

Science Notes

Type 2 Writing Essay

Unit Key Terminology & Definitions:

Fossils

Rock

formations

Deposition

Erosion

Vegetation

Weathering

Physical characteristics

Earthquake

Geographic

Geologic

Hazards

Mountain range

Natural

Plate tectonics

Trench

Volcano

Lakes

Lentic

Lotic

Ponds

Rivers

Streams

Watersheds

Erosion

Fossil

Landform

Organism

Minerals

Rock layers

Dams

Fossil fuels

Earthquake

Natural hazard

Tsunami

Volcanic eruptions

Weather

STANDARDS: **STANDARDS**

STATE: Pennsylvania State Anchors (2010)

S4.D.1 (Advanced)	Earth Features and Processes that Change Earth and Its Resources
S4.D.1.1 (Advanced)	Describe basic landforms in Pennsylvania.
S4.D.1.1.1 (Advanced)	Describe how prominent Earth features in Pennsylvania (e.g., mountains, valleys, caves, sinkholes, lakes, rivers) were formed.
S4.D.1.1.2 (Advanced)	Identify various Earth structures (e.g., mountains, watersheds, peninsulas, lakes, rivers, valleys) through the use of models.
S4.D.1.1.3 (Advanced)	Describe the composition of soil as weathered rock and decomposed organic remains.

Topic: Weathering and Erosion

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.1 (Advanced)	Earth Features and Processes that Change Earth and Its Resources
S4.D.1.1 (Advanced)	Describe basic landforms in Pennsylvania.
S4.D.1.1.2 (Advanced)	Identify various Earth structures (e.g., mountains, watersheds, peninsulas, lakes, rivers, valleys) through the use of models.
S4.D.1.1.3 (Advanced)	Describe the composition of soil as weathered rock and decomposed organic remains.

Topic: Landforms

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.1 (Advanced)	Earth Features and Processes that Change Earth and Its Resources
S4.D.1.1 (Advanced)	Describe basic landforms in Pennsylvania.
S4.D.1.1.1 (Advanced)	Describe how prominent Earth features in Pennsylvania (e.g., mountains, valleys, caves, sinkholes, lakes, rivers) were formed.
S4.D.1.1.2 (Advanced)	Identify various Earth structures (e.g., mountains, watersheds, peninsulas, lakes, rivers, valleys) through the use of models.

Topic: The Rock Cycle

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.1 (Advanced)	Earth Features and Processes that Change Earth and Its Resources
S4.D.1.1.3 (Advanced)	Describe the composition of soil as weathered rock and decomposed organic remains.

Topic: Layers of the Earth

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.1 (Advanced)	Earth Features and Processes that Change Earth and Its Resources

Topic: Renewable and Nonrenewable Energy

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.1 (Advanced)	Earth Features and Processes that Change Earth and Its Resources
S4.D.1.2 (Advanced)	Identify the types and uses of Earth's resources.

S4.D.1.2.2 (Advanced)	Identify the types and uses of Earth materials for renewable, nonrenewable, and reusable products (e.g., human-made products: concrete, paper, plastics, fabrics).

Unit: Matter and Energy

Timeline: Week 18 to 21

Unit Description:

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

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

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

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

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

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

Unit Essential Questions:

How can one explain the structure, properties, and interactions of matter?

How is energy transferred and conserved?

How are waves used to transfer energy and information?

Unit Big Ideas:

Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.

Interactions between any two objects can cause changes in one or both.

Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.

Unit Materials:

Harcourt Science 4th Grade Textbook

Science Journal

Youtube Video

Unit Assignments:

Read Lessons

Science Notes

Type 2 Writing Essay

Unit Test

Unit Key Terminology & Definitions:

Matter

Atom

Element

Solid

Liquid

Gas

Amplitude

Wavelength

Frequency

Waves

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.1 (Advanced)	Structure, Properties, and Interaction of Matter and Energy
S4.C.1.1 (Advanced)	Describe observable physical properties of matter.
S4.C.2 (Advanced)	Forms, Sources, Conversion, and Transfer of Energy
S4.C.2.1 (Advanced)	Recognize basic energy types and sources, or describe how energy can be changed from one form to another.
S4.C.2.1.1 (Advanced)	Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical).

Topic: Changes in States of Matter

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.1 (Advanced)	Structure, Properties, and Interaction of Matter and Energy
S4.C.1.1 (Advanced)	Describe observable physical properties of matter.
S4.C.1.1.1 (Advanced)	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 (Advanced)	Categorize/group objects using physical characteristics.

Topic: Transfer of Energy

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.1 (Advanced)	Structure, Properties, and Interaction of Matter and Energy
S4.C.2 (Advanced)	Forms, Sources, Conversion, and Transfer of Energy
S4.C.2.1 (Advanced)	Recognize basic energy types and sources, or describe how energy can be changed from one form to another.
S4.C.2.1.1 (Advanced)	Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical).

Topic: Potential and Kinetic Energy

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.1 (Advanced)	Structure, Properties, and Interaction of Matter and Energy
S4.C.2 (Advanced)	Forms, Sources, Conversion, and Transfer of Energy
S4.C.2.1 (Advanced)	Recognize basic energy types and sources, or describe how energy can be changed from one form to another.
S4.C.2.1.1 (Advanced)	Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical).

Topic: Energy in Waves

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.2.1.4 (Advanced)	Identify characteristics of sound (e.g., pitch, loudness, reflection).

Unit: Electricity

Timeline: Week 22 to 24

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

Compare and contrast series and parallel circuits.

Unit Essential Questions: What is electricity?

How can one explain and predict interactions between objects within systems?

Unit Big Ideas: Electric current can be used for many purposes.

Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.

Unit Materials: Harcourt Science 4th Grade Textbook

Science Journal

Materials to build Circuits

Claverac Rural Electric Company

Unit Assignments: Read Lessons

Type 2 Writing Essay

Building Circuits Lab

Unit Test

Unit Key Terminology & Definitions: Electricity

Conductor

Insulator

Parallel circuit

Serial circuit System

Closed circuit

Open circuit Switch System

Static Electricity

Current Electricity

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.2.1.3 (Advanced)	Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches.

Topic: Static and Current Electricity

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.2.1.2 (Advanced)	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 (Advanced)	Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches.

Topic: Parallel vs Series Circuits

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.2.1.3 (Advanced)	Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches.

Unit: Magnetism

Timeline: Week 25 to 26

Unit Description: Demonstrate that magnets have poles that repel and attract each other.

Unit Essential Questions: How can magnets be used?

How can one explain and predict interactions between objects within systems?

Unit Big Ideas: Magnetism and Electricity are related.

Interactions between any two objects can cause changes in one or both.

Unit Materials: Harcourt Science 4th Grade Textbook

Science Journal

Make a magnet lab materials

Make an electromagnet lab materials

Unit Assignments: Read Lessons

Science Notes

Type 2 Writing Essay

Make a Magnet Lab

Make an Electromagnet Lab

Unit Test

Unit Key Terminology & Definitions: Magnet

Magnetic Poles

Magnetic Field

Electromagnet

Generator

Attract

Repel

Current Electromagnet System

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.3.1.1 (Advanced)	Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).

Topic: Magnetism a Force

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.3.1.1 (Advanced)	Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).

Topic: Magnets and Electro Magnets

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.3.1.1 (Advanced)	Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).

Unit: Force and Motion

Timeline: Week 27 to 28

Unit Description: **Explain how an object's change in motion can be observed and measured.**

Explain how Gravity effects objects.

Unit Essential Questions: How is motion described and measured?

Why is the force of gravity important?

How can one explain and predict interactions between objects within systems?

Unit Big Ideas: Motion can be measured and described.

Interactions between any two objects can cause changes in one or both.

Unit Materials: Harcourt Science 4th grade Textbook

Science Journal

Balloon Car Lab Materials

Unit Assignments: Read Lessons

Science Notes

Type 2 Writing Essay

Balloon Car Lab

Unit Test

Unit Key Terminology & Definitions:

Force

Motion

Speed

Position

Mass

Acceleration

Gravity

Friction

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.A.1.3.2 (Advanced)	Describe relative size, distance, or motion.
S4.C.3 (Advanced)	Principles of Motion and Force
S4.C.3.1 (Advanced)	Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion.
S4.C.3.1.2 (Advanced)	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 (Advanced)	Describe the position of an object by locating it relative to another object or a stationary background (e.g., geographic direction, left, up).

Topic: Gravity

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.3.1.1 (Advanced)	Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).

Topic: Motion

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.C.3 (Advanced)	Principles of Motion and Force
S4.C.3.1 (Advanced)	Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion.
S4.C.3.1.1 (Advanced)	Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).
S4.C.3.1.2 (Advanced)	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 (Advanced)	Describe the position of an object by locating it relative to another object or a stationary background (e.g., geographic direction, left, up).

Unit: Earth's Place in the Universe

Timeline: Week 29 to 34

Unit Description: **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.

Know the basic characteristics and uses of telescopes.

Identify major lunar phases.

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

Describe motions of the Sun - Earth - Moon system.

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

Unit Essential Questions:

How do Earth and it's moon move?

What causes the seasons?

What is the universe, and what is Earth's place in it?

Unit Big Ideas: Objects in space, including the Earth and it's moon, move in regular and observable patterns.

The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.

Unit Materials: Harcourt Science 4th Grade Textbook

Science Journal

Moon Phase Foldable

Unit Assignments:

Read Lessons

Type 2 Writing Essays

Moon Phase Foldable

Planetary Order/Fact Quiz

Unit Test

Unit Key Terminology & Definitions:

Universe

Galaxy

Solar System

Axis

Axial Tilt

Rotation

Revolution

Telescope

Moon

Phases

STANDARDS:

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.A.3.2 (Advanced)	Use models to illustrate simple concepts and compare the models to what they represent.
S4.A.3.3.2 (Advanced)	Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, lunar phases).
S4.D.3 (Advanced)	Composition and Structure of the Universe
S4.D.3.1 (Advanced)	Describe Earth's relationship to the Sun and the Moon.
S4.D.3.1.1 (Advanced)	Describe motions of the Sun - Earth - Moon system.
S4.D.3.1.2 (Advanced)	Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years).
S4.D.3.1.3 (Advanced)	Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis.

Topic: Earth's Place in the Universe

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.3 (Advanced)	Composition and Structure of the Universe
S4.D.3.1 (Advanced)	Describe Earth's relationship to the Sun and the Moon.

Topic: Galaxies

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.3 (Advanced)	Composition and Structure of the Universe

Topic: Cycles of the Sun, Earth, Moon

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.3.1 (Advanced)	Describe Earth's relationship to the Sun and the Moon.
S4.D.3.1.1 (Advanced)	Describe motions of the Sun - Earth - Moon system.
S4.D.3.1.2 (Advanced)	Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years).

Topic: Lunar Phases

Minutes for Topic: 45

STANDARDS

STATE: Pennsylvania State Anchors (2010)

S4.D.3.1 (Advanced)	Describe Earth's relationship to the Sun and the Moon.
S4.D.3.1.1 (Advanced)	Describe motions of the Sun - Earth - Moon system.
S4.D.3.1.2 (Advanced)	Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years).