Unit 2: Earth and Sun

Content Area: **Science**
Course(s): **Science**
Time Period: **Week 1**
Length: **11 Weeks**
Status: **Published**

Unit Overview

In this unit, students will explore the properties of the atmosphere, energy transfer from the Sun to Earth and the dynamics of weather and water cycling in Earth's atmosphere. Additional experiences will help students develop and use models to understand Earth's place in the solar system and the interactions of Earth, the Sun and the Moon to reveal predictable patterns, daily length and direction of shadows, day and night and the seasonal appearance of stars in the night sky. Students will gain experiences that will contribute to the understanding of crosscutting concepts of patterns, cause and effect, scale, proportion, quantity, systems and system models, energy and matter.

Standards

Disciplinary Core Ideas (DCI's)

5-PS1-1	Develop a model to describe that matter is made of particles too small to be seen.
5-PS2-1	Support an argument that the gravitational force exerted by Earth on objects is directed down.
5-ESS1-1	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
5-ESS1-2	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
5-ESS2-1	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
5-ESS3-1	Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.
5-ESS2-2	Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Crosscutting Concepts (CC's)

CCC.2.1	students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity might or might not signify a cause and effect relationship.
CCC.3.1	students recognize natural objects and observable phenomena exist from the very small

	to the immensely large. They use standard units to measure and describe physical quantities such as weight, time, temperature, and volume.
CCC.4.1	students understand that a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot. They can also describe a system in terms of its components and their interactions.
SCI.3-5.1.2	Patterns of change can be used to make predictions.
SCI.3-5.2.2	Events that occur together with regularity might or might not be a cause and effect relationship.
SCI.3-5.4.2	A system can be described in terms of its components and their interactions.
SCI.3-5.5.3	Energy can be transferred in various ways and between objects.

Science and Engineering Practices (SEP's)

SEP.1.c	Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
SEP.2.c	Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution.
SEP.3.a	Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
SEP.4.b	Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.
SEP.5.b	Organize simple data sets to reveal patterns that suggest relationships.
SEP.6.a	Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).
SEP.6.b	Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.
SEP.6.c	Identify the evidence that supports particular points in an explanation.
SEP.7.a	Compare and refine arguments based on an evaluation of the evidence presented.
SEP.8.a	Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.
SEP.8.d	Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.

Essential Questions

Investigation 1 - The Sun:

- How and why does your shadow change during the day?
- What can be learned by studying the length and direction of shadows?
- What causes day and night?

Investigation 2 - Planetary Systems:

- How can you explain why we see some natural objects only in the night sky, some only in the day sky and some at both times?

- How would you describe the size of and distance between Earth, the Moon and the Sun?
- How does the shape of the Moon change over 4 weeks?
- How do the parts of the solar system interact?
- Why do stars appear to move across the night sky?

Investigation 3 - Earth's Atmosphere:

- What is air?
- What is Earth's atmosphere?
- How do meteorologists measure and record weather variables?

Investigation 4 - Heating Earth:

- What happens to Earth materials when they are exposed to sunlight?
- How does energy transfer to the air?
- What happens when a volume of fluid is warmed at the bottom?
- What is the best design for a solar water heater?

Investigation 5 - Water Planet:

- What causes condensation to form?
- How does water vapor get into the air?
- What is the water cycle?
- What is the difference between weather and climate?

Application of Knowledge: Students will know that...

- A great deal of light travels through space to Earth from the Sun and from distant stars.
- A solar water heater is a system that uses solar energy to heat water.
- Air has mass, takes up space and is compressible.
- Air is a mixture of gases held by gravity near Earth's surface.
- As temperature increases, the rate of evaporation increases.
- Climate is the average or typical weather that can be expected to occur in a region of Earth's surface.
- Convection is the circulation of fluid (liquid or gas) that results in energy transfer. Convection currents are driven by uneven heating of Earth's surface.
- Day is the half of Earth's surface being illuminated by sunlight; night is the half of Earth's surface in its own shadow.
- Evaporation and condensation contribute to the movement of water through the water cycle, redistributing water over Earth's surface.
- Meteorology is the science of weather and meteorologists are the scientists who study Earth's weather.
- Most of Earth's air resides in the troposphere, the layer of the atmosphere closet to Earth's surface.
- Most of Earth's water (97%) is salt water in the ocean; Earth's fresh water is found in the atmosphere, lakes and rivers, soil, ground ice, ground water and glaciers.

- Shadows are the dark areas that result when light is blocked.
- Shadows change during the day because the position of the Sun changes in the sky.
- Stars are at different distances from Earth.
- Stars are different sizes and have different brightnesses.
- The atmosphere is heated by conduction between Earth's surfaces and air particles as a result of contact, and by absorption of energy radiated directly from the Sun and reradiated from Earth's surfaces.
- The cyclical change between day and night is the result of Earth's rotating around the stationary Sun.
- The different energy-transferring properties of earth materials (soil and water) can lead to uneven heating of Earth's surface.
- The length and direction of a shadow depends on the Sun's position in the sky.
- The Moon is much smaller than Earth and orbits at a distance equal to about 30 Earth diameters.
- The pulling force of gravity keeps the planets and other objects in orbit by continuously changing their direction of travel.
- The solar system includes the Sun and the objects that orbit it, including Earth, the Moon and seven other planets, their satellites and smaller objects.
- The Sun is 12,000 Earth diameters away from Earth and is more than 100 times larger than Earth.
- The Sun is the major source of energy that heats the Earth.
- The Sun's energy drives weather.
- Weather happens in the troposphere.
- Weather is described in terms of several variables.
- Weather is the condition of Earth's atmosphere at a given time in a given place.

Application of Skills: Students will be able to...

- Analyze and interpret data.
- Ask questions.
- Construct explanations.
- Develop and use models.
- Engage in argument from evidence.
- Obtain, evaluate and communicate information.
- Plan and carry out investigations.
- Use mathematics and computational thinking.

Assessments

Investigation 1 - The Sun:

- Formative Assessments: Science notebook entries (Focus Questions - How and why does your shadow change during the day? What can be learned by studying the length and directions of shadows? What causes day and night?; New Vocabulary - orientation, shadow, sun), Response Sheet
- Benchmark Assessment: Survey (pre and post), Investigation 1 I-Check

Investigation 2 - Planetary Systems:

- Formative Assessments: Science notebook entries (Focus Questions - How can you explain why we see some natural objects only in the night sky, some only in the day sky and some at both times? How would you describe the size of and distance between Earth, the Moon and the Sun? How does the shape of the moon change over 4 weeks? How do the parts of the solar system interact? Why do stars appear to move across the night sky?; New Vocabulary - moon, night sky, planet, star), Performance assessment - Teacher observes the rich conversation among students and the actions they are taking to investigate phenomena or design solutions to problems, Response Sheet
- Benchmark Assessment: Investigation 2 I-Check

Investigation 3 - Earth's Atmosphere:

- Formative Assessments: Performance assessment - Teacher observes the rich conversation among students and the actions they are taking to investigate phenomena or design solutions to problems, Science notebook entries (Focus Questions - What is air? What is Earth's atmosphere? How do meteorologists measure and record weather variables?; New Vocabulary - air, atmosphere, compress, mass, matter, pressure)
- Benchmark Assessment: Investigation 3 I-Check

Investigation 4 - Heating Earth:

- Formative Assessments: Science notebook entries (Focus Questions - What happens to earth materials when they are exposed to sunlight? How does energy transfer to the air? What happens when a volume of fluid is warmed at the bottom? What is the best design for a solar water heater?; New Vocabulary - earth material, energy transfer, experiment, radiation, ray, solar energy, solar energy exposure, uneven heating, variable), Response Sheet, Performance assessment - Teacher observes the rich conversation among students and the actions they are taking to investigate phenomena or design solutions to problems
- Benchmark Assessment: Investigation 4 I-Check

Investigation 5 - Water Planet:

- Formative Assessments: Performance assessment - Teacher observes the rich conversation among students and the actions they are taking to investigate phenomena or design solutions to problems, Response Sheet, Science notebook entries (Focus Questions - What causes condensation to form? How does water vapor get into the air? What is the water cycle? What is the difference between weather and climate?; New Vocabulary - condensation, condense, dew, fog, frost, water vapor)
- Benchmark Assessment: Posttest - identical to pre-survey

Suggested Activities

Investigation 1 - The Sun:

Part 1 - Shadow Shifting

- Students trace their shadows in the morning and afternoon and compare the tracings.
- Assessment - 1 Session, Active Investigation Time - 2 Sessions

- Writing/Reading - Science Notebook Entry: Answer the focus question; *Shadow Challenges*

Part 2 - Sun Tracking

- Pairs of students construct Sun trackers.
- Active Investigation Time - 2 - 3 Sessions, Reading - 1 Session
- Writing/Reading - Science Notebook Entry: *Sun Tracker Recording*
- Science Resources Book - "Changing Shadows"
- Online Activities - "Tutorial: Sun Tracking", "Shadow Tracker"

Part 3 - Day and Night

- Students imagine one of their eyes as an observer on Earth and position themselves around a lamp to observe day and night.
- Active Investigation Time - 1 Session, Reading - 1 Session, Assessment - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Day/Night Questions*
- Science Resources Book - "Sunrise and Sunset"
- Online Activity - "Seasons"

Investigation 2 - Planetary Systems:

Part 1 - Night-Sky Observations

- Students take a mini-field trip to the schoolyard to look for the Moon.
- Active Investigation Time - 2 Sessions, Reading - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Night-Sky Log*
- Science Resources Book - "The Night Sky", Looking Through Telescopes"

Part 2 - How Big and How Far?

- Students grapple with the size and distance relationships among Earth, the Moon and the Sun.
- Active Investigation - 1 Session, Reading - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Modeling Earth, Moon and Sun*
- Science Resources Book - "Comparing the Size of Earth and the Moon", "Apollo 11 Space Mission", "How Did Earth's Moon Form?"

Part 3 - Phases of the Moon

- Students analyze the Moon observations to discover the sequence of changes.
- Active Investigation Time - 2 Sessions, Reading - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Phases of the Moon, Looking at the Moon from Earth*
- Science Resources Book - "Changing Moon", "Lunar Cycle", "Eclipses"
- Video - *All About the Moon*
- Online Activity - "Lunar Calendar"

Part 4 - The Solar System

- Students work in pairs with a set of solar system cards.
- Active Investigation Time - 2 Sessions, Reading - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Solar System Data*
- Science Resources Book - "Exploring the Solar System", "Planets of the Solar System", "Why Doesn't Earth Fly Off Into Space?"

- Video - *The Planets and the Solar System*

Part 5 - Stars

- Students are introduced to constellations as traditional star patterns.
- Active Investigation Time - 2 Sessions, Reading - 2 Sessions, Assessment - 2 Sessions
- Writing/Reading - Science Notebook Entry: *"All About Stars" Review*
- Science Resources Book - "Stargazing", "Star Scientists", "Our Galaxy"
- Video - *All About Stars*
- Online Activities - "Star Maps", "Stellar Motions"

Investigation 3 - Earth's Atmosphere:

Part 1 - The Air Around Us

- Students take a close look at the air surrounding us.
- Active Investigation Time - 1 Session, Reading - 1 Session
- Writing/Reading - Science Notebook Entry: Answer the focus question
- Science Resources Book - "What Is Air?"
- Videos - *Ball on a Scale, Fizz Keeper Experiment, Soda Can Experiment*

Part 2 - The Atmosphere

- Students study Earth's atmosphere, using diagrams, photos from space and a reading.
- Active Investigation Time - 1 Session, Reading - 1 Session
- Writing/Reading - Science Notebook Entry: *Atmosphere Questions*
- Science Resources Book - "Earth;s Atmosphere"
- Video - *Earth's Atmosphere*
- Online Activity - "Tutorial: Air and Atmosphere"

Part 3 - Local Weather

- Students review local weather reports and determine the variables that combine to produce the weather.
- Active Investigation Time - 1 Session, Reading - 1 Session, Assessment - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Weather Data*
- Science Resources Book - "Weather Instruments"
- Video - *All About Meteorology*
- Online Activity - "Weather Grapher"

Investigation 4 - Heating Earth:

Part 1 - Heating Earth Materials

- Students set up an investigation to monitor temperature changes when solar energy is transferred to two earth materials: water and dry soil.
- Active Investigation Time - 3 Sessions, Reading - 1 Session
- Writing/Reading - Science Notebook Entry: *Graph for Heating Earth Materials*
- Science Resources Book - "Uneven Heating"
- Online Activities - "Tutorial: Radiation", "Virtual Investigation: Uneven Heating"

Part 2 - Conduction

- Students observe two examples of heat transfer by conduction: from hot water to a container of cold water, and from one end of a metal strip to another.
- Active Investigation Time - 2 Sessions, Reading - 1 Session
- Writing/Reading - Science Notebook Entry: *Conduction with Metal Strips*
- Science Resources Book - "Heating the Air: Radiation and Conduction"
- Video - *Aluminum and Steel Strips*
- Online Activities - "Particles in Solids, Liquids, Gases", ""Energy Transfer"

Part 3 - Convection

- Students use a fluid, water, at different temperatures to discover the relationship between temperature and density.
- Active Investigation Time - 1 Session, Reading - 1 Session
- Writing/Reading - Science Notebook Entry: *Heating Ice and Water*
- Science Resources Book - "Wind and Convection", "Wind Power"
- Video - *Convection*
- Online Activity - "Energy Transfer"

Part 4 - Color and Energy Transfer

- Students set up solar water heaters using black and white collectors to see if color affects temperature change in water.
- Active Investigation Time - 2 - 3 Sessions, Reading - 1 Session, Assessment - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Water-Heater Team Data, Graph for Water Heaters*
- Science Resources Book - "Solar Technology"

Investigation 5 - Water Planet:

Part 1 - Condensation

- Students set up cups of ice water and room temperature water and observe condensation on the ice-water cup.
- Active Investigation Time - 2 Sessions, Reading - 1 Session
- Writing/Reading - Science Notebook Entry: *Condensation Observations, Water-and-Ice Systems*
- Science Resources Book - "Condensation"

Part 2 - Evaporation

- Students observe a demonstration in which cups with equal amounts of water are placed on a balance.
- Active Investigation Time - 2 Sessions
- Writing/Reading - Science Notebook Entry: Answer the focus question

Part 3 - Water Cycle

- Students consider why Earth is called the water planet.
- Active Investigation Time - 2 Sessions, Reading - 2 Sessions
- Writing/Reading - Science Notebook Entry: *Water-Cycle Activity*
- Science Resources Book - "Where Is Earth's Water?", "The Water Cycle", "Severe Weather"
- Video - *Climate and Seasons*
- Online Activity - "Climate Regions Map"

Part 4 - Climate

- Students are introduced to climate and suggest schemes for describing world climate regions, based on their understanding of weather variables.
- Active Investigation Time - 1 Session, Reading - 2 - 3 Sessions, Assessment - 2 Sessions
- Writing/Reading - Science Notebook Entry: Answer the focus question
- Science Resources Book - "Earth's Climates", "Global Climate Change"
- Video - *Climate and Seasons*
- Online Activity - "Climate Regions Map"

Activities to Differentiate Instruction

Differentiation for special education:

- General modifications may include:
    - Modifications & accommodations as listed in the student's IEP
    - Assign a peer to help keep student on task
    - Modified or reduced assignments
    - Reduce length of assignment for different mode of delivery
    - Increase one-to-one time
    - Working contract between you and student at risk
    - Prioritize tasks
    - Think in concrete terms and provide hands-on-tasks
    - Position student near helping peer or have quick access to teacher
    - Anticipate where needs will be
    - Break tests down in smaller increments

Differentiation for ELL's:

- General modifications may include:
    - Strategy groups
    - Teacher conferences
    - Graphic organizers
    - Modification plan
    - Collaboration with ELL Teacher

- Content specific vocabulary important for ELL students to understand include: orientation, shadow, Sun, compass, axis, day, night, North Pole, North Star, orbit, revolution, rotation, sunrise, sunset, asteroid, Asteroid belt, comet, constellation, dwarf planet, force, gas giant planet, gravity, Kuiper Belt, moon, night sky, phase, planet, solar system, star, terrestrial planet, lunar cycle, crescent moon, first-quarter moon, full moon, gibbous moon, new moon, third-quarter moon, waning moon, waxing moon, air, air pressure, atmosphere, barometer, compress, forecast, humidity, hygrometer, mass, matter, meteorologist, precipitation, pressure, temperature, thermometer, troposphere, visibility, weather, weather variable, wind, wind direction, wind speed, wind vane, absorb, conduction, contract, convection current, Earth material, energy transfer, expand, experiment, fluid, geosphere, hydrosphere, less dense, more dense, radiant energy, radiation, ray, reflect, reradiation, solar collector, solar energy, solar energy exposure, solar water heater, uneven heating, variable, climate, climatologist, condensation, condense, dew, drought, evaporate, evaporation, fog, fresh water, frost, glacier, ground water, hurricane, ice cap, lake, ocean, recycle, river, salt water, severe weather, thunderstorm, tornado,

water cycle, water vapor

Differentiation to extend learning for gifted students may include:

- Home/School Connection
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    - Investigation 1 – The Sun:

Extensions - Read Sun and Shadow stories and retell them to the class, go on a treasure hunt using a compass, describe shadows and write a story or a piece of poetry using shadows as a theme, math extension - problem of the week with graphing, investigate compasses and degrees, research how engineers use circles, match bar graphs to shadow scenarios, track the sun, research sundials, research shadow theater, create a sundial and track angles

    - Investigation 2 – Planetary Systems:

Extensions - Research Apollo missions, math extension - problem of the week, visit a planetarium, plan a visit with an astronomy club, research the moons of other planets, explore star brightness, create a space-exploration time line, compare human age to orbiting years of other planets

    - Investigation 3 – Earth's Atmosphere:

Extensions - Explore weather topics, research weather lore, math extension - problem of the week, use a spreadsheet to look at weather data, track weather reports, contact the National Weather Service, find out how digital weather stations work, explore careers in meteorology, weigh the air in a sports ball, draw atmosphere posters, explore atmospheric research from space, engineer a device to slow a falling object, gather local weather data for 5 days and compare the forecast to the actual weather

    - Investigation 4 – Heating Earth:

Extensions - list the effects of heat, math extension - problem of the week, investigate other Earth materials, investigate direct sunlight, eliminate the air, design other solar water heaters, solar-energy technology in your community, determine how distance from the Sun affect a planet's temperature, determine how long it takes for vegetables to bear fruit

    - Investigation 5 - Water Planet:

Extensions - write to a TV meteorologist, math extension - problem of the week, compare precipitation locations, make a rain gauge, find out about dew point, search for severe weather, review the USDA plant hardiness zone map, investigate energy sources to heat water

Integrated/Cross-Disciplinary Instruction

Investigation 1 - The Sun:

- Language Extensions - Read Sun and shadow stories and retell them to the class; Go on a treasure hunt using a compass to give directions; Write descriptive stories or poems about shadows

- Math Extensions - Problem of the Week; Study and use circles and degrees; Research engineers that use circles in their design processes; Match bar graphs to shadow stories and descriptions
- Engineering Extensions - Continue to track the Sun over the course of multiple days and compare results; Research and construct sundials
- Social Studies Extension - Research shadow theater and create a script to perform

Investigation 2 - Planetary Systems:

- Language Extension - Research Apollo missions and the Moon explorations
- Math Extension - Problem of the Week
- Social Studies Extension - Create a space exploration time line by the US and other countries

Investigation 3 - Earth's Atmosphere:

- Language Extension - Explore weather topics (i.e. weather disasters, weather and business, weather and health, weather and professional sports, weather and clothing, weather and travel, etc.); Research weather lore (i.e. When smoke descends, good weather ends)
- Math Extensions - Problem of the Week; Use a spreadsheet to document and compare and contrast weather data

Investigation 4 - Heating Earth:

- Language Extension - List the effects of heat on materials (i.e. burn, scorch, boil, stew, roast, etc.)
- Math Extension - Problem of the Week
- Engineering Extensions - Investigate other Earth materials that have different properties that may affect temperature change; Investigate the effects of angled and straight-on sunlight on materials; Investigate how temperature would change if air was eliminated; Design an efficient solar water heater; Research solar-energy technology in the community; Research the effects of planet distance from the sun with the amount of energy received

Investigation 5 - Water Planet:

- Language Extension - Write to a meteorologist and inquire how daily temperatures are determined
- Math Extension - Problem of the Week
- Engineering Extension - Compare rainfall of different regions; Make rain gauges to track rainfall; Research dew point and the relationship it has with humidity and temperature; Research regions with severe weather and document them on a map; Review the USDA plant hardiness zone map

LA.RI.5.1	Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
LA.RI.5.2	Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
LA.RI.5.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
LA.RI.5.8	Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
LA.RF.5.4	Read with sufficient accuracy and fluency to support comprehension.
LA.W.5.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

MA.5.MD.A	Convert like measurement units within a given measurement system.
MA.5.MD.A.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
MA.5.MD.B	Represent and interpret data.
MA.5.MD.B.2	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.
MA.5.MD.C	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
MA.5.MD.C.5a	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
MA.5.MD.C.5b	Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.
MA.5.MD.C.5c	Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.
LA.W.5.8	Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
LA.W.5.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
LA.SL.5.4	Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Resources

Investigation 1 - The Sun:

- Science Resources Book - "Changing Shadows", "Sunrise and Sunset"

Investigation 2 - Planetary Systems:

- Science Resources Book - "The Night Sky", "Looking through Telescopes", "Comparing the Size of Earth and the Moon", "Apollo 11 Space Mission", "How Did Earth's Moon Form?", "Exploring the Solar System", "Planets of the Solar System", "Why Doesn't Earth Fly Off into Space?", "Stargazing", "Star Scientists", "Our Galaxy"
- Videos - *All About the Moon, The Planets and the Solar System, All About Stars*

Investigation 3 - Earth's Atmosphere:

- Science Resources Book - "What is Air?", "Earth's Atmosphere", "Weather Instruments"
- Videos - *Ball on a Scale, Fizz Keeper Experiment, Soda Can Experiment, Earth's Atmosphere*

Investigation 4 - Heating Earth:

- Science Resources Book - "Uneven Heating", "Heating the Air", "Wind and Convection", "Wind Power", "Solar Technology"
- Videos - *Aluminum and Steel Strips, Convection*

Investigation 5 - Water Planet:

- Science Resources Book - "Condensation", "Where is Earth's Water?", "The Water Cycle", "Severe Weather", "Earth's Climates", "Global Climate Change"
- Videos - *Water Cycle, Climate and Seasons*

21st Century Skills

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.