Quinton Township School District
Science
Grade 5
[Pacing Guide]

Marking Period:	One & Two	Unit Title:	Physical Science	Pacing:	60 days

Unit Summary: In this unit of study, students describe that matter is made of particles too small to be seen by developing a model. Students also develop an understanding of the idea that regardless of the type of change that matter undergoes, the total weight of matter is conserved. Students determine whether the mixing of two or more substances results in new substances. The crosscutting concepts of *cause and effect* and *scale, proportion, and quantity* are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in planning and carrying out investigations and using mathematics and computational thinking. Students are expected to use these practices to demonstrate understanding of the core ideas. Students will also learn about the career of research scientist Albert Yu-Min Lin and his contributions to the world. **@**

Objectives:
- Define matter as having mass and taking up space.
- Describe matter as consisting of particles.
- Compare and contrast the properties of solids, liquids, and gases.
- Infer that a solution contains particles too small to see.
- Develop a model to describe that matter is made of particles too small to be seen.
- Construct and test a model.
- Evaluate the validity of a model.
- Use a model to successfully communicate a concept.
- Identify seven physical properties of matter.
- Describe hardness.
- Order the degrees of hardness of various materials.
- Determine the hardness order of minerals by performing scratch tests.
- Describe magnetism.

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- Identify substances that are attracted to a magnet.
- Explain how the property of magnetism can be tested.
- Classify matter based on its ability to conduct or insulate electrical energy.
- Identify materials that conduct and do not conduct electricity.
- Classify matter based on its ability to conduct or insulate thermal energy.
- Determine the solubility in water of various materials.
- Define the boiling and melting points of matter.
- Identify the boiling and melting points of water.
- Describe how boiling affects the state of water.
- Define condensation.
- Describe how the cooling of water can change its state.
- Determine whether matter is conserved during a change in state.
- Describe changes in the physical properties of matter that occur during changes in state.
- Determine whether matter is conserved when one material is mixed with another material.
- Find evidence that supports the Law of Conservation of Matter.
- Plan and conduct an investigation.
- Organize, analyze, and interpret data.
- Express a scientific generalization.
- Define and describe a chemical change.
- Compare and contrast chemical changes and physical changes.
- Distinguish between a chemical change and a chemical reaction.
- Identify the signs of a chemical change.
- Demonstrate that matter is conserved though changed during a chemical reaction.
- Distinguish materials based on an analysis of their physical and chemical properties.
- Identify the goal of research scientist Albert Yu-Min Lin and the tools he employs to reach that goal. **@**

Essential Questions:
What is matter?
How can findings demonstrate conservation of matter?
What is a chemical reaction?
How is a chemical change different from a physical change and how is it the same?

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NJSLS - Science Standards: 5-PS1-1, 5-PS1-2 , 5-PS1-3, 5-PS1-4
Interdisciplinary Connections: 5.NBT.A.1, 5.NF.B.7, 5.DL.A.1, RI.CR.5.1
Career Readiness, Life Literacies, and Key Skills: 9.4.5.CI.3, 9.4.5.CT.1
Computer Science and Design Thinking: 8.1.5.DA.1, 8.1.5.DA.3, 8.1.5.DA.5, 9.4.5.TL.1
Career Education: 9.2.5.CAP.3, 9.2.5.CAP.4

Overview of Activities	Core Resources	Supplemental Resources	Technology Infusion
Lesson 1- Matter Lesson 2- States of Matter - Science in a Snap Lesson 3 - Investigate Matter Lesson 4 - Think Like a Scientist: Develop a Model Lesson 5 - Properties of Matter Lesson 6 - Hardness: Science in a Snap Lesson 7- Investigate Hardness Lesson 8 - Magnetism Science in a Snap Lesson 9 - Electrical Conductivity Lesson 10 - Investigate Electrical Conductivity Lesson 11 - Thermal Conductivity Science in a Snap Lesson 12 - Investigate Solubility	myngconnect.com Teacher Edition myngconnect.com Teacher Resources	balloons, string, safety goggles, salt plastic cup (approx. 9 oz. size); water, plastic teaspoon (measuring spoon preferred); dropper; black construction paper; hand lens 2- and 3-dimensional materials from which students can choose, including: paper, poster board, foam, foil, clay, snap blocks, chenille stems, craft sticks, and any other selection	• Smart Board Applications • Google Applications • My NG Connect • Legends of Learning • Personal Computers

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Lesson 13 - Heating Lesson 14 - Cooling Lesson 15 - Investigate: Changing States of Water Lesson 16 - Investigate: Mixtures Lesson 17- Think Like a Scientist: Provide Evidence Lesson 18 - Chemical Changes Lesson 19 - Signs of a Chemical Change Lesson 20 - Investigate Chemical Reactions Lesson 21- Think Like a Scientist: Identify Materials Lesson 22 - Science Career: Research Scientist		of objects that can be repurposed for modeling, plastic spoon, aluminum washer, copper penny, steel paper clip, rubber band, orange crayon	

Assessments	
Formative Assessments ● Exit tickets ● Science Investigation Journal Responses and Data Collection	**Summative Assessments** ● Changes in Matter Models ● Changes in Matter Investigation Reports ● End of Unit Assessment
Benchmark Assessments ● District-assigned Benchmark Assessments (e.g. LinkIt, literacy screeners, content-specific benchmarks)	**Alternative Assessments** ● Alternative Choice Projects ● Oral Assessments

Differentiation			
Special Education	**MLL**	**At Risk**	**Gifted and Talented**

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• Modify and accommodate as listed in student IEP or 504 plan. • Utilize wait time effectively. • Communicate clear, concise directions and repeat, reword, modify as necessary. • Use visual aids during lessons and small-group time. • Utilize extended time and/or reduce number of items given for homework, quizzes, and tests. • Vary formative assessment styles to drive next point of instruction. • Create modified assessments. • Allow students to utilize online audio books, when appropriate. • Allow for collaboration through strategically selected groups. • Utilize assistive technology as appropriate. • Utilize graphic organizers. • Provide and model sentence frames/sentence starters. • Utilize manipulatives as necessary.	• Basic Skills Instruction • Speech/Language Therapy • Rosetta Stone • Provide English/Native Language Dictionary for use. • Place with native-language-speaking teacher/paraprofessional as available. • Use target words and cognates to understand texts. • Remind students to underline passages and list words they don't understand. • Learn/Utilize/Display some words in the students' native language. • Provide and model sentence frames to help students participate in discussion. • Provide word banks to help students write. • Translate printed communications in native language for parents. • Hold conferences with translator present.	• Basic Skills Instruction • Provide after-school tutoring services. • Hold fall and spring parent conferences. • Make modifications to instructional plans based on I and RS Plan. • Utilize wait time effectively. • Develop a record system to encourage good behavior and completion of work. • Utilize scaffolding to support instruction. • Provide counseling if necessary to help students cope with challenges. • Utilize strategic grouping with a positive academic role model. • Utilize graphic organizers.	• Promote self-initiated and self-directed learning for growth though independent projects. • Challenge students with age-appropriate texts at higher reading levels. • Allow for the development and application of productive thinking skills to enable students to re-conceptualize existing knowledge and/or generate new knowledge. • Provide for the development of self-understanding of one's relationships with people, societal institutions, nature and culture.

Quinton Township School District
Science
Grade 5

Marking Period:	Two & Three	Unit Title:	Life Science	Pacing:	60 Days

Unit Summary: In this unit, students will recognize that the energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). They also examine food webs in which some animals eat plants for food and other animals eat the animals that eat plants. They explore decomposition and how a healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. They also evaluate how changes to an ecosystem, such as through newly introduced species, can damage the balance needed for all to thrive. The crosscutting concepts of *energy and matter* and *systems and system models* are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in *developing and using models* and *engaging in argument from evidence*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Additionally, in February, students will explore the contributions of Black scientists and inventors to celebrate Black History Month.*

Objectives:
- List the three main things that plants need to live and grow.
- Identify the source of the energy that plants use to make the food they need to survive.
- Explain that the energy that plants use to live and grow was once energy from the sun.
- Describe the process of photosynthesis.
- Explain that plants get the materials they need for growth chiefly from air and water.
- Identify some of the conditions that make it difficult to grow enough food for all the people on Earth.
- Describe hydroponics and explain how its use can help increase the supply of food for humans.
- Conduct an investigation to determine if plants can grow without soil.
- Use evidence to support the argument that plants get the materials they need for growth chiefly from air and water.
- Explain that food provides animals with the materials they need for growth and body repair, and the energy they need for

motion and to maintain body warmth.

- Use a food chain to describe the flow of energy from the sun through the plants and animals in an ecosystem.
- Use food chains to compare the pathway of energy from the sun through the organisms in two different environments.
- Use a model to describe that energy in animals' food was once energy from the sun.
- Describe the flow of energy from the sun through the organisms in a food web.
- Describe the role of decomposers in food webs and in cycles of matter.
- Describe how matter cycles through an ecosystem and among the plants, animals, and microbes that live and die in the environment.
- Explain that organisms can survive only in environments in which their particular needs are met.
- Describe the levels of organisms that make up an ecosystem.
- Observe the way organisms live and survive in their ecosystem by interacting with other organisms and nonliving elements
- Describe the flow of energy derived from the sun through an ecosystem.
- Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- Describe how newly introduced species can damage the balance of an ecosystem.
- Describe how a newly introduced species is damaging the balance of an ecosystem.
- Explain how scientists are using another species to control the population of an invasive species.
- Describe how a conservationist studies the natural world and works with other people to save natural resources.
- Explain how Black scientists and inventors have contributed to society's advancement.

Essential Questions:
How do plants and animals work together to form a healthy ecosystem?
How do the physical characteristics of an environment help support the organisms that live there?
How do conservationists protect our planet?

NJSLS - Science Standards: 5-PS3-1, 5-LS1-1, 5-LS2-1

Interdisciplinary Connections: 5.DL.A.1, RI.CR.5.1, W.AW.5.1, 5.MD.A.1

Career Readiness, Life Literacies, and Key Skills: 9.4.5.CI.3, 9.4.5.CT.1

Computer Science and Design Thinking: 8.1.5.DA.1, 8.1.5.DA.3, 8.1.5.DA.5, 9.4.5.TL.1
Career Education: 9.2.5.CAP.1, 9.2.5.CAP.3, 9.2.5.CAP.4

Overview of Activities	Core Resources	Supplemental Materials	Technology Infusion
Lesson 1- What Plants Need Lesson 2 - How Plants Get Energy Lesson 3 - Materials for Plant Growth Lesson 4 - Think Like an Engineer- Case Study: Growing Crops Lesson 5 - Investigate: Hydroponics Lesson 6 - Think Like a Scientist: Support an Argument Lesson 7 - Why Animals Need Food Lesson 8 - Desert Food Chain Lesson 9 - Think Like a Scientist: Compare and Contrast Lesson 10 - Think Like a Scientist: Use Models Lesson 11 - Desert Food Web Lesson 12 - Decomposers Lesson 13 - Cycles of Matter Lesson 14 - Tallgrass Prairie Ecosystem Lesson 15 - Grassland Populations and Communities Lesson 16 - Investigate: Interactions in a Model Pond Lesson 17- Think Like a Scientist:	myngconnect.com Teacher Edition myngconnect.com Teacher Resources	clear plastic container (about 8 oz.) and lid with a hole in the center; young plant pitcher of water cotton balls (3) liquid houseplant fertilizer (5 drops) clear plastic bottle sand small rocks in plastic cup elodea water pitcher plastic spoon 3 snails in plastic cup hand lens *For teacher use*: sharp scissor masking tape	• Google Applications • My NG Connect • Legends of Learning • Personal Computers • SmartBoard Applications

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Develop a Model Lesson 18- Plants Invade Lesson 19 - Think Like a Scientist: Case Study- Animals Invade Lesson 20 - Science Career- Conservationist Black History Month lessons*			

Assessments	
Formative Assessments ● Exit tickets ● Science Investigation Journal Responses and Data Collection	**Summative Assessments** ● Food Chain Models ● Pond Models ● End of Unit Assessment
Benchmark Assessments ● District-assigned Benchmark Assessments (e.g. LinkIt, literacy screeners, content-specific benchmarks)	**Alternative Assessments** ● Alternative Choice Projects ● Oral Assessments

Differentiation			
Special Education	**MLL**	**At Risk**	**Gifted and Talented**
● Modify and accommodate as listed in student IEP or 504 plan. ● Utilize wait time effectively. ● Communicate clear, concise directions and repeat, reword, modify as necessary. ● Use visual aids during lessons and small-group time. ● Utilize open-ended questioning techniques. ● Utilize extended time and/or	● Basic Skills Instruction ● Speech/Language Therapy ● Rosetta Stone ● Provide English/Native Language Dictionary for use. ● Place with native-language-speaking teacher/paraprofessional as available. ● Use target words and cognates to understand texts. ● Remind students to underline	● Basic Skills Instruction ● Provide after-school tutoring services. ● Hold fall and spring parent conferences. ● Make modifications to instructional plans based on I and RS Plan. ● Utilize wait time effectively. ● Develop a record system to encourage good behavior and completion of work.	● Promote self-initiated and self-directed learning for growth though independent projects. ● Challenge students with age-appropriate texts at higher reading levels. ● Allow for the development and application of productive thinking skills to enable students to re-conceptualize existing knowledge and/or

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reduce number of items given for homework, quizzes, and tests. • Vary formative assessment styles to drive next point of instruction. • Create modified assessments. • Allow students to utilize online audio books, when appropriate. • Allow for collaboration through strategically selected groups. • Utilize assistive technology as appropriate. • Utilize graphic organizers. • Provide and model sentence frames/sentence starters. • Utilize manipulatives as necessary. • Provide breaks to allow for refocusing as necessary.	passages and list words they don't understand. • Learn/Utilize/Display some words in the students' native language. • Provide and model sentence frames to help students participate in discussion. • Provide word banks to help students write. • Translate printed communications in native language for parents. • Hold conferences with translator present.	• Utilize scaffolding to support instruction. • Provide counseling if necessary to help students cope with challenges. • Utilize strategic grouping with a positive academic role model. • Utilize graphic organizers.	generate new knowledge. • Provide for the development of self-understanding of one's relationships with people, societal institutions, nature and culture.

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Science
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Marking Period:	Three & Four	**Unit Title:**	Earth Science	**Pacing:**	60 Days

Unit Summary: In this unit of study, students are able to describe ways in which the geosphere, biosphere, hydrosphere, and atmosphere interact. The crosscutting concept of *systems and system models* is called out as an organizing concept for this disciplinary core idea. Students are expected to demonstrate grade-appropriate proficiency in developing and using models, obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas. Additionally, in February, students will explore the contributions of Black scientists and inventors to celebrate Black History Month.*****

Objectives:
- Identify Earth's major systems.
- Recognize that these systems interact and affect Earth's materials and processes.
- Describe the geosphere, one of Earth's major systems, and explain how the geosphere interacts with other Earth systems to affect Earth's surface materials and processes.
- Describe the hydrosphere, one of Earth's major systems, and explain how the hydrosphere interacts with other systems to affect Earth's surface materials and processes.
- Describe the atmosphere, one of Earth's major systems, and explain how the atmosphere interacts with other Earth systems to affect Earth's surface materials and processes.
- Describe the biosphere, one of Earth's major systems, and explain how the biosphere interacts with other Earth systems to affect Earth's surface materials and processes.
- Describe how interactions of Earth's systems result in weather patterns known as monsoons.
- Model the interactions of Earth's major systems.
- Describe how the geosphere, atmosphere, hydrosphere, and biosphere interact.
- Describe the variety of ecosystems and organisms in the ocean.
- Describe how the ocean shapes the land.

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- Explain the processes of erosion and deposition.
- Describe how the ocean influences climate.
- Explain the difference between weather and climate.
- Describe how winds and clouds in the atmosphere interact with landforms to determine patterns of weather.
- Explain how processes in Earth's atmosphere interact with and change the shape of landforms.
- Work with a group to develop a model that describes an interaction between two of Earth's systems, or spheres.
- Explain the interactions demonstrated in their model.
- Recognize that nearly all of Earth's available water is in the ocean.
- Identify sources of freshwater on Earth: glaciers, underground, streams, lakes, wetlands, and the atmosphere.
- Graph the amounts and percentages of saltwater and freshwater on Earth.
- Identify air, plants, water, animals, coal, oil, and natural gas as natural resources.
- Classify air, plants, water, and animals as renewable resources, and coal, oil, and natural gas as nonrenewable resources.
- Identify ways in which human activities affect the land.
- Identify ways in which human activities affect vegetation.
- Model the impact of human activity on various ecosystems.
- Describe how acidic chemicals affect the growth of plants.
- Identify ways that human activities impact water sources on Earth.
- Identify ways that human activities impact air in Earth's atmosphere.
- Describe ways that people are working together to clean up the air.
- Identify ways in which human activities impact space.
- Explain the importance of conserving Earth's resources and how recycling can help conserve resources.
- Identify the benefits of trees in an urban environment.
- Describe methods that engineers have developed for growing trees in crowded cities.
- Describe the difference between nonrenewable and renewable energy resources.
- Explain why it is important for humans to conserve energy resources.
- Describe alternative energy resources, such as solar, wind, and hydroelectric energy.
- Investigate how solar energy can be used to make water cleaner.
- Work with a group to obtain information about ways individual communities use science ideas to protect Earth's resources and environment.
- Combine information from their investigation to communicate their results to others.
- Describe the gravitational force of Earth acting on an object near Earth.
- Gather data to support an argument that the gravitational force exerted by Earth on objects is directed down.

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- Describe how the Earth, sun, and moon move in space and as a system.
- Relate gravitational force to the motions of Earth, the sun, and the moon in space.
- Recognize that the sun is a star that appears larger and brighter than other stars because it is the star closest to Earth.
- Understand that stars range greatly in their distance from Earth.
- Investigate to show that the apparent brightness of a light-emitting object varies with distance from the observer.
- Use data from the investigation to support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.
- Explain that Earth rotates on its axis once every 24 hours to cause the day/night cycle.
- Demonstrate that Earth rotates on its axis once every 24 hours to cause the day/night cycle.
- Explain what causes the apparent motion of the sun across the sky.
- Demonstrate the different positions of the sun at different times of day.
- Demonstrate that the rotation of Earth about an axis causes observable changes in patterns of shadows over time.
- Collect and record information using tools, including a meter stick and a clock.
- Recognize that the orbit of Earth around the sun causes observable patterns such as the sequence of seasons over time.
- Represent data in a graph to reveal patterns of seasonal changes in the length of day and night.
- Describe how Earth's orbit around the sun causes observable patterns in the positions of the stars at different times of year.
- Represent data in a graphical display that reveals the patterns of change in the seasonal appearance of some stars in the night sky.
- Use the graphical display to describe patterns of stars.
- Describe the moon's motions, including rotation, orbiting of Earth, and apparent movement across the sky.
- Explain why moon phases occur.
- Describe the pattern of the moon's phases.
- Collect and analyze data to identify sequences and predict patterns of change in the moon's observable appearance over time.
- Collect information about the moon's phases by making detailed observations.
- Connect the concepts of astronomy with the career of an astrobiologist and science educator.
- Explain how Black scientists and inventors have contributed to society's advancement.

Essential Questions:
How do Earth's four major systems interact?
How do individual communities use science ideas to protect Earth's resources and environment?

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NJSLS - Science Standards: 5-ESS1-1, 5-ESS1-2, 5-ESS2-1, 5-ESS2-2, 5-ESS3-1, 5-PS2-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3
Interdisciplinary Connections: 5.G.A.2, 5.DL.A.1, RI.CR.5.1, W.AW.5.1, 5.MD.A.1
Career Readiness, Life Literacies, and Key Skills: 9.4.5.CI.3, 9.4.5.CT.1
Computer Science and Design Thinking: 8.1.5.DA.1, 8.1.5.DA.3, 8.1.5.DA.5, 9.4.5.TL.1
Career Education: 9.2.5.CAP.1, 9.2.5.CAP.3, 9.2.5.CAP.4

Overview of Activities	**Core Resources**	**Supplemental Materials**	**Technology Infusion**
Lesson 1 - Earth's Major Systems Lesson 2 - The Geosphere Lesson 3 - The Hydrosphere Lesson 4 - The Atmosphere Lesson 5 - The Biosphere Lesson 6 - Earth's Systems Interact Lesson 7 - Investigate: Interactions of Earth's Systems Lesson 8 - Ocean Ecosystems Lesson 9 - The Ocean Shapes the Land Lesson 10 - The Ocean Influences Climate Lesson 11 - Landforms and Weather Patterns Lesson 12 - The Atmosphere and Landforms Lesson 13 - Think Like a Scientist:	myngconnect.com Teacher Edition myngconnect.com Teacher Resources	clear 2-L plastic bottle with top cut off; gravel (enough to fill the bottom of the bottle to a depth of about 2.5 cm); potting soil (about 500 mL to fill bottom half of bottle); plastic spoon; small plants; water; masking tape For Models- poster board; colored markers, pencils, or crayons; modeling clay; construction paper; craft sticks; aluminum foil; rulers; tape; glue;	• Smart Board Applications • Google Applications • myngconnect.com • Personal Computers

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Develop a Model Lesson 14 - Water on Earth Lesson 15 - Investigate: Graphing Water Date Lesson 16 - Earth's Resources Lesson 17 - Humans Impact the Land Lesson 18 - Humans Impact Vegetation Lesson 19 - Investigate: Plants and Pollution Lesson 20 - Humans Impact Water Lesson 21 - Humans Impact Air Lesson 22 - Humans Impact Space Lesson 23 - Protecting Land, Air, and Water: Science in a Snap Lesson 24 - Think Like an Engineer: Case Study: Tower of Trees Lesson 25 - Renewable Energy Resources Lesson 26 - Investigate Using Solar Energy Lesson 27 - Think Like a Scientist: Obtain and Combine Information Lesson 28 - Gravity on Earth Lesson 29 - Investigate Gravity Lesson 30 - Earth, Sun, and Moon Lesson 31 - Our Star; The Sun: Science in a Snap Lesson 32 - Investigate Apparent Brightness Lesson 33 - Day and Night: Science in a Snap		heavy cardboard (for model bases); plastic shoe boxes; soil; sand; small plants; gravel; 2-L bottles; plastic wrap; rubber bands; plastic cups; spray bottles. graph paper; 9-oz. plastic cups; tape; 75 mL water; 25 mL vinegar; graduated cylinder; 2 containers of rye grass; hand lens; ruler; spoon plastic container (such as a plastic shoe box); small ball of clay; 9-oz. plastic cup; measuring cup; water; sandy soil; spoon; plastic wrap; rubber band; rock unsharpened pencil; eraser; coin; crumpled paper; rubber ball 3 penlights; tape; tissue paper; meter stick	

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Lesson 34 - Apparent Motion: Science in a Snap Lesson 35 - Investigate: Sunlight and Shadows Lesson 36 - Revolution and the Seasons Lesson 37 - Investigate: Graph Hours of Daylight Lesson 38 - Earth's Orbit and the Night Sky Lesson 39 - Think Like a Scientist: Represent Data Lesson 40 - Moon Motions Lesson 41 - Moon Phases Lesson 42 - Investigate Moon Phases Lesson 43 - Science Career: Astrobiologist and Science Educator Black History Month lessons*		lump of clay (about the size of a large marble); sheet of poster board; unsharpened pencil; colored pencil; masking tape or rocks; meter stick craft stick or pencil; foam ball; lamp with 60-watt bulb (to be shared by groups); meter stick *For teacher use:* masking tape	

Assessments	
Formative Assessments ● Exit tickets ● Science Investigation Journal Responses and Data Collection	**Summative Assessments** ● Geosphere, Biosphere, Hydrosphere, and Atmosphere Models ● End of Unit Assessment
Benchmark Assessments ● District-assigned Benchmark Assessments (e.g. LinkIt, literacy screeners, content-specific benchmarks)	**Alternative Assessments** ● Alternative Choice Projects ● Oral Assessments

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