

Quinton Township School District
Science Curriculum Guide
Grade 6
[Pacing Guide](#)

Marking Period	1	Unit Title	Astronomy	Pacing	40 days
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Unit Summary: This unit is broken down into 2 sub-ideas: the universe and its stars, and Earth and the solar system. Students examine the Earth’s place in relation to the solar system, the Milky Way galaxy, and the universe. There is a strong emphasis on a systems approach and using models of the solar system to explain the cyclical patterns of eclipses, tides, and seasons. There is also a strong connection to engineering through the instruments and technologies that have allowed us to explore the objects in our solar system and obtain the data that support the theories explaining the formation and evolution of the universe. Students examine geosciences data in order to understand the processes and events in Earth’s history. The crosscutting concepts of *patterns, scale, proportion, and quantity* and *systems and systems models* provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in *developing and using models* and *analyzing and interpreting data*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Knowledge - By the end of this unit, students will know:

- Scientists hypothesize that the universe began with a “Big Bang.”
- Celestial bodies (planets, stars, moons, etc) are formed and are held in orbit by the force of gravity.
- The brightness of a star depends on its distance and size.
- Characteristics of various celestial bodies, including the Sun and the Moon.
- What causes the tides, solar/lunar eclipses, and seasons.

Skills - By the end of this unit, students will be able to:

- Explain the Big Bang Theory and evidence supporting it.
- Identify the factors that determine the strength of gravity and explain gravity’s role in our universe.
- Describe the makeup of a star and the factors that determine a star’s brightness.
- Describe the celestial bodies in our solar system.
- Explain what effects the motions of the Earth, Sun and Moon have on us (particularly the Tides, Eclipses, and Seasons).

Essential Questions:

- How did our universe form?
- What holds our galaxy and solar system together?
- What determines the brightness of a star, and what are the properties of our Sun?

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- What different types of objects can be found in our solar system?
- Why do the objects in our solar system follow a curved path around our Sun?
- What effects do the Moon and Sun have on us here on Earth?

NJSLS - Science Standards:

- **MS-ESS1-1** - Develop and use a model of the Earth-Sun-Moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
- **MS-ESS1-2** - Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system
- **MS-ESS1-3** - Analyze and interpret data to determine scale properties of objects in the solar system.

Interdisciplinary Connections: 6.RP.A.1, 7.RP.A.2, 6.EE.B.6, 7.EE.B.6

Career Readiness, Life Literacies, and Key Skills: 9.4.8.IML.1, 9.4.8.IML.3, 9.4.8.TL.3

Computer Science and Design Thinking: 8.2.8.ITH.2

Career Education: 9.2.8.CAP.12

Overview of Activities	Core Resources	Supplemental Materials	Technology Infusion
• The Universe and Its Stars/ Earth and the Solar System Classwork/Homework • Lab 1: Galaxy Tour • Lab 2: Gravity Lab • Lab 3: Apparent Motion of the Stars • Lab 4: Planet Research • Lab 5: Solar Distances Activity • Lab 6: Orbit • Lab 7: Solar System Revolution • Lab 8: Eclipses	• The Universe and Its Stars/ Earth and the Solar System Classwork/Homework Answers Guide • The Universe and Its Stars/ Earth and the Solar System SMART Notebook Notes • NJCTL.com • Legends of Learning • Edpuzzle • The Universe and Its Stars/ Earth and the Solar System Pacing Guide	• The Universe and Its Stars/ Earth and the Solar System SMART Notebook Notes • The Universe and Its Stars/ Earth and the Solar System Classwork/Homework • Labs	• SMARTboard Applications • Google Applications • Legends of Learning • Edpuzzle

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Assessments	
Formative Assessments • Daily Science Starters • Daily/Weekly Classwork & Homework Completion • Kahoot! • Rubric-for projects • Self-reflection	Summative Assessments • Quiz 1 - Beginning of the Universe/Galaxies • Test - The Universe and Its Stars Test • Quiz 2 - Birth of the Sun and Solar System • Quiz 3 - Types of Celestial Bodies • Quiz 4 - Motion of Objects Around the Sun • Quiz 5 - The Moon and the Tides • Test - Earth and the Solar System Test
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
• Teacher's aide will read to the students as needed • Students can type or speech to text notes. • The students will be given study guides for tests • Students will be given notes for quizzes • Projects will be modified for students who need it to be. • Homework is also modified for those students who need it. • Students will be given extra time to complete all assignments.	• Provide MLL students with multiple literacy strategies. • Rosetta Stone • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).	• Teacher's aide will read to the students as needed • Students can type or speech to text notes. • Students will be given extra time to complete all assignments. • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering	• Allow students to provide additional support for students struggling (peer teaching) • Expanded learning projects to further student understanding • Student teaching lessons • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and

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• All quizzes and tests have been modified for the students to meet their needs. • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understanding. • Use project-based science learning to connect science with observable phenomena. • Structure the learning around explaining or solving a social or community-based issue. • Collaborate with after-school programs or clubs to extend learning opportunities.	• Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. • Translate printed communications for parents in native language • Hold conferences with translator present • Review Special Education listing for additional recommendations	practices to provide students with multiple entry points and multiple ways to demonstrate their understanding. • Make modifications to instructional plans based on I and RS Plan.	cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. • Use project-based science learning to connect science with observable phenomena. • Promote self-initiated and self-directed learning and growth. • Enable students to explore continually changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
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Marking Period	2	Unit Title	Earth's Systems	Pacing	40 days
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Unit Summary: Students examine geoscience data in order to understand processes and events in Earth's history. Important crosscutting concepts in this unit are *scale, proportion, and quantity, stability and change, and patterns* in relation to the different ways geologic processes operate over geologic time. An important aspect of the history of Earth is that geologic events and conditions have affected the evolution of life, but different life forms have also played important roles in altering Earth's systems. Students understand how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems. Students investigate the controlling properties of important materials and construct explanations based on the analysis of real geoscience data. Students are expected to demonstrate proficiency in *analyzing and interpreting data* and *constructing explanations*. They are also expected to use these practices to demonstrate understanding of the core ideas. #

Knowledge - By the end of this unit, students will know:

- Scientists hypothesize that the universe began with a "Big Bang."
- Celestial bodies (planets, stars, moons, etc) are formed and are held in orbit by the force of gravity.
- The brightness of a star depends on its distance and size.
- Characteristics of various celestial bodies, including the Sun and the Moon.
- What causes the tides, solar/lunar eclipses, and seasons.

Skills - By the end of this unit, students will be able to:

- Explain the Big Bang Theory and evidence supporting it.
- Identify the factors that determine the strength of gravity and explain gravity's role in our universe.
- Describe the makeup of a star and the factors that determine a star's brightness.
- Describe the celestial bodies in our solar system.
- Explain what effects the motions of the Earth, Sun and Moon have on us (particularly the Tides, Eclipses, and Seasons).

Essential Questions:

- How has Earth changed over time?
- How do severe weather events impact Earth?
- What do paleontologists do?

NJSLS - Science Standards:

- **MS-ESS1-4** - Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

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- **MS-ESS2-1** - Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
- **MS-ESS2-2** - Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
- **MS-ESS2-3** - Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

Interdisciplinary Connections: RI.CR.6.1, W.IW.6.2, W.WR.6.5, W.SE.6.6, 6.EE.B.6

Career Readiness, Life Literacies, and Key Skills: 9.4.8.CI.1, 9.4.8.CT.1

Computer Science and Design Thinking: 8.2.8.ITH.2, 9.4.8.DC.1, 9.4.8.IML.1, 9.4.8.IML.3, 9.4.8.IML.4, 9.4.8.TL.3

Career Education: 9.2.8.CAP.6, 9.2.8.CAP.9, 9.2.8.CAP.12

Overview of Activities	Core Resources	Supplemental Materials	Technology Infusion
● History of Planet Earth/ Plate Tectonics and Natural Disasters Classwork/Homework ● Lab 1: Fossils Layer Webquest ● Lab 2: Cookie Excavation ● Lab 3: Vertebrate Fossil Webquest ● Lab 4: Radiometric Dating ● Lab 5: Tabletop Earthquake ● Lab 6: Tabletop Tsunami ● Lab 7: Tabletop Volcano	● History of Planet Earth/ Plate Tectonics and Natural Disasters Classwork/Homework Answers Guide ● History of Planet Earth/ Plate Tectonics and Natural Disasters SMART Notebook Notes ● NJCTL.com ● Legends of Learning ● Edpuzzle ● The Universe and Its Stars/ Earth and the Solar System Pacing Guide	● History of Planet Earth/ Plate Tectonics and Natural Disasters SMART Notebook Notes ● History of Planet Earth/ Plate Tectonics and Natural Disasters Classwork/Homework ● Labs	● SMARTboard Applications ● Google Applications ● Legends of Learning ● Edpuzzle

Assessments	
Formative Assessments ● Daily Science Starters ● Daily/Weekly Classwork & Homework Completion	Summative Assessments ● Quiz 1 - Layers of Earth/Rock Cycle ● Test - History of Planet Earth Test

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• Kahoot! • Rubric-for projects • Self-reflection	• Quiz 2 - Pangaea/Energy Flow Quiz • Test - Plate Tectonics and Natural Disasters Test
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
• Teacher's aide will read to the students as needed • Students can type or speech to text notes. • The students will be given study guides for tests • Students will be given notes for quizzes • Projects will be modified for students who need it to be. • Homework is also modified for those students who need it. • Students will be given extra time to complete all assignments. • All quizzes and tests have been modified for the students to meet their needs. • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.	• Provide MLL students with multiple literacy strategies. • Rosetta Stone • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understanding.	• Teacher's aide will read to the students as needed • Students can type or speech to text notes. • Students will be given extra time to complete all assignments. • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understanding. • Make modifications to instructional plans based on I and RS Plan.	• Allow students to provide additional support for students struggling (peer teaching) • Expanded learning projects to further student understanding • Student teaching lessons • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with

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• Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understanding. • Use project-based science learning to connect science with observable phenomena. • Structure the learning around explaining or solving a social or community-based issue. • Collaborate with after-school programs or clubs to extend learning opportunities.	• Translate printed communications for parents in native language • Hold conferences with translator present • Review Special Education listing for additional recommendations		multiple entry points and multiple ways to demonstrate their understanding. • Use project-based science learning to connect science with observable phenomena. • Promote self-initiated and self-directed learning and growth. • Enable students to explore continually changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
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Marking Period	3	Unit Title	Weather and Climate	Pacing	40 days
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Unit Summary: This unit is broken down into two sub-ideas: the roles of water in Earth's surface processes, and weather and climate. Students make sense of how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems. A systems approach is also important here, examining the feedbacks between systems as energy from the Sun is transferred between systems and circulates through the ocean and atmosphere. The crosscutting concepts of *cause and effect*, *systems and system models*, and *energy and matter* are called out as frameworks for understanding the disciplinary core ideas. In this unit, students are expected to demonstrate proficiency in *developing and using models* and *planning and carrying out investigations* as they make sense of the disciplinary core ideas. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Knowledge - By the end of this unit, students will know:

- Stages of the water cycle, including relevant vocabulary.
- What causes global movement of water.
- How differences in temperature and salinity form a global pattern of currents.
- How weathering and erosion caused by water's movement change the land's features.
- The effect that various factors have on weather and climate.
- How atmospheric and oceanic circulation occurs.
- What probability forecasting is and how it is used.
- What natural disasters are how they are predicted.

Skills - By the end of this unit, students will be able to:

- Describe the water cycle and the forces that drive it.
- Explain the impact of sunlight and gravity on global movements of water.
- Identify the global pattern of interconnected ocean currents.
- Describe the difference between weathering and erosion along with their impact on landforms.
- Describe the effects that factors and locations have on weather and climate.
- Describe how circulation transports heat and moisture around the Earth.
- Translate information on a weather map into a weather forecast.
- Create a weather map based on information.
- Explain how natural disasters can be predicted.

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Essential Questions:

- How does the continuous movement of water through the Earth's systems (evaporation, condensation, precipitation, etc.) impact the availability of water and influence weather patterns and ecosystems?

NJSLS - Science Standards:

- **MS-ESS2-2** - Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
- **MS-ESS2-4** - Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- **MS-ESS2-5** - Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
- **MS-ESS2-6** - Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation determine regional climates.
- **MS-ESS3-2** - Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Interdisciplinary Connections: RI.CR.6.1, W.IW.6.2, W.WR.6.5, W.SE.6.6, 6.NS.C.5

Career Readiness, Life Literacies, and Key Skills: 9.4.8.CI.1, 9.4.8.CT.1

Computer Science and Design Thinking: 8.2.8.ETW.1, 8.2.8.ETW.3, 8.2.8.ETW.4, 9.4.8.IML.8

Career Education: 9.2.8.CAP.10

Overview of Activities	Core Resources	Supplemental Materials	Technology Infusion
• Role of Water in Earth's Surface Processes/ Weather and Climate Classwork/Homework • Lab 1: Changing Water • Lab 2: Global Circulation • Lab 3: Erosion and Weathering • Lab 4: Ocean Circulation Simulation	• Role of Water in Earth's Surface Processes/ Weather and Climate Classwork/Homework Answers Guide • Role of Water in Earth's Surface Processes/ Weather and Climate SMART Notebook Notes • NJCTL.com	• Role of Water in Earth's Surface Processes/ Weather and Climate SMART Notebook Notes • Role of Water in Earth's Surface Processes/ Weather and Climate Classwork/Homework • Labs	• SMARTboard Applications • Google Applications • Legends of Learning • Edpuzzle

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• Lab 5: Climate Trends • Lab 6: Weather Predictions	• Legends of Learning • Edpuzzle • Role of Water in Earth's Surface Processes/ Weather and Climate Pacing Guide		
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Assessments	
Formative Assessments • Daily Science Starters • Daily/Weekly Classwork & Homework Completion • Kahoot! • Rubric-for projects • Self-reflection	Summative Assessments • Quiz 1 - Water Cycle • Quiz 2 - Forces of the Water Cycle/ Global Currents • Quiz 3 - Weathering and Erosion • Test - Role of Water in Earth's Surface Processes Test • Quiz 1 - Sunlight and Circulation • Quiz 2 - Geography and Weather Prediction • Test - Weather and Climate Test
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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• Projects will be modified for students who need it to be. • Homework is also modified for those students who need it. • Students will be given extra time to complete all assignments. • All quizzes and tests have been modified for the students to meet their needs. • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understanding. • Use project-based science learning to connect science with observable phenomena.	• Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. • Translate printed communications for parents in native language • Hold conferences with translator present • Review Special Education listing for additional recommendations	• Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understanding. • Make modifications to instructional plans based on I and RS Plan.	social/family background and knowledge of their community. • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. • Use project-based science learning to connect science with observable phenomena. • Promote self-initiated and self-directed learning and growth. • Enable students to explore continually changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
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Marking Period	3	Unit Title	Evidence of Common Ancestry	Pacing	30 days
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Unit Summary: In this unit of study, students analyze graphical displays and gather evidence from multiple sources in order to develop an understanding of how fossil records and anatomical similarities of the relationships among organisms and species describe biological evolution. Students search for patterns in the evidence to support their understanding of the fossil record and how those patterns show relationships between modern organisms and their common ancestors. The crosscutting concepts of *cause and effect*, *patterns*, and *structure and function* are called out as organizing concepts for these disciplinary core ideas. Students use the practices of *analyzing graphical displays* and *gathering, reading, and communicating information*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Knowledge - By the end of this unit, students will know:

- The different eras of the Phanerozoic Era.
- What fossils are and how fossilization occurs.
- The theory of evolution from a common ancestor.
- Different types of evidence that support evolution from a common ancestor (fossil record, homology, embryological development).
- How natural selection drives evolution.

Skills - By the end of this unit, students will be able to:

- Describe the Paleozoic, Mesozoic and Cenozoic Eras.
- Determine the relative ages of fossils in rock.
- Explain different types of fossils and how fossilization occurs.
- Explain the theory of evolution from a common ancestor.
- Describe different pieces of evidence that support evolution from a common ancestor (fossil record, homology and embryological development).
- Explain how natural selection drives evolution.

Essential Questions:

- How do fossils and other evidence reveal the history of life on Earth and demonstrate the concept of common ancestry?

NJSLS - Science Standards:

- **MS-LS4-1-** Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of

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life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.

- **MS-LS4-2-** Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
- **MS-LS4-3** - Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
- **MS-LS4-4** - Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- **MS-LS4-6** - Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Interdisciplinary Connections: RI.CR.6.1, W.IW.6.2, W.WR.6.5, W.SE.6.6, 6.EE.B.6, 6.RP.A.1, 6.SP.B.5

Career Readiness, Life Literacies, and Key Skills: 9.4.8.CI.1, 9.4.8.CT.1

Computer Science and Design Thinking: 8.2.8.ITH.1, 9.4.8.DC.1, 9.4.8.IML.1, 9.4.8.IML.9, 9.4.8.IML.13, 9.4.8.IML.14, 9.4.8.IML.15, 9.4.8.TL.3

Overview of Activities	Core Resources	Supplemental Materials	Technology Infusion
● Evidence of Common Ancestry Classwork/Homework ● Lab 1: Geological Timeline ● Lab 2: Fossil Cast ● Lab 3: Classifying Collage	● Evidence of Common Ancestry Classwork/Homework Answers Guide ● Evidence of Common Ancestry SMART Notebook Notes ● NJCTL.com ● Legends of Learning ● Edpuzzle ● Evidence of Common Ancestry Pacing Guide	● Evidence of Common Ancestry SMART Notebook Notes ● Evidence of Common Ancestry Classwork/Homework ● Labs	● SMARTboard Applications ● Google Applications ● Legends of Learning ● Edpuzzle

Assessments	
Formative Assessments ● Daily Science Starters ● Daily/Weekly Classwork & Homework Completion	Summative Assessments ● Quiz 1 - Fossils & Fossilization ● Quiz 2 - Evidence of Evolution

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• Kahoot! • Rubric-for projects • Self-reflection	• Test - Evidence of Evolution Test
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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• Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). • Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understanding. • Use project-based science learning to connect science with observable phenomena. • Structure the learning around explaining or solving a social or community-based issue. • Collaborate with after-school programs or clubs to extend learning opportunities.	• Translate printed communications for parents in native language • Hold conferences with translator present • Review Special Education listing for additional recommendations		multiple entry points and multiple ways to demonstrate their understandings. • Use project-based science learning to connect science with observable phenomena. • Promote self-initiated and self-directed learning and growth. • Enable students to explore continually changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
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Marking Period	4	Unit Title	Matter, Energy and Relationships of Organisms in Ecosystems	Pacing	30 days
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Unit Summary: Students *analyze and interpret data, develop models, construct arguments*, and demonstrate a deeper understanding of the cycling of matter, the flow of energy, and resources in ecosystems. They are able to study patterns of interactions among organisms within an ecosystem. They consider biotic and abiotic factors in an ecosystem and the effects these factors have on populations. They also understand that the limits of resources influence the growth of organisms and populations, which may result in competition for those limited resources. The crosscutting concepts of *matter and energy, systems and system models, patterns*, and *cause and effect* provide a framework for understanding the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in analyzing and interpreting data, developing models, and constructing arguments. Students are also expected to use these practices to demonstrate understanding of the core ideas. Students build on their understandings of the transfer of matter and energy as they study patterns of interactions among organisms within an ecosystem. They consider biotic and abiotic factors in an ecosystem and the effects these factors have on a population. They construct explanations for the interactions in ecosystems and the scientific, economic, political, and social justifications used in making decisions about maintaining biodiversity in ecosystems. The crosscutting concept of *stability and change* provides a framework for understanding the disciplinary core ideas.

This unit includes a two-stage engineering design process. Students first evaluate different engineering ideas that have been proposed using a systematic method, such as a tradeoff matrix, to determine which solutions are most promising. They then test different solutions, and combine the best ideas into a new solution that may be better than any of the preliminary ideas. Students demonstrate grade appropriate proficiency in *asking questions, designing solutions, engaging in argument from evidence, developing and using models*, and *designing solutions*. Students are also expected to use these practices to demonstrate understanding of the core ideas. #

Knowledge - By the end of this unit, students will know:

- The levels of ecological organization.
- The difference between biotic and abiotic factors.
- How competition, predator/prey and mutualism affect populations.
- Various factors that affect population size.
- The roles of producers, consumers and decomposers.
- How energy cycles through an ecosystem.
- How a food web shows the flow of energy.

Skills - By the end of this unit, students will be able to:

- Give examples of the levels of ecology.

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- Give examples of competition, predator/prey and mutualism.
- Describe how organisms depend on their environment.
- Explain how population size changes based on various factors.
- Describe the roles of producers, consumers and decomposers.
- Describe the transfer of energy through organisms in a food chain.

Essential Questions:

- How do living things interact with each other and their environment to obtain the resources they need to survive?

NJSLS - Science Standards:

- **MS-LS2-1-** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- **MS-LS2-2-** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- **MS-LS2-3 -** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem
- **MS-LS2-4 -** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- **MS-LS2-5 -**Evaluate competing design solutions for maintaining biodiversity and ecosystem services.#

Interdisciplinary Connections: RI.CR.6.1, W.IW.6.1, W.WR.6.5, 6.RP.A.3, W.SE.6.6, 6.EE.C.9, 6.SP.B.5

Career Readiness, Life Literacies, and Key Skills: 9.4.8.CI.1, 9.4.8.CT.1, 9.4.8.CT.2, 9.4.8.CT.3

Computer Science and Design Thinking: 8.2.8.ETW.4, 9.4.8.IML.8

Career Education: 9.2.8.CAP.6, 9.2.8.CAP.9

Overview of Activities	Core Resources	Supplemental Materials	Technology Infusion
• Matter, Energy and Relationships of Organisms in Ecosystems Classwork/Homework • Lab 1: Breaking it Down Activity	• Matter, Energy and Relationships of Organisms in Ecosystems Classwork/Homework Answers Guide • Matter, Energy and Relationships of	• Matter, Energy and Relationships of Organisms in Ecosystems SMART Notebook Notes • Matter, Energy and Relationships of Organisms in Ecosystems	• SMARTboard Applications • Google Applications • Legends of Learning • Edpuzzle

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• Lab 2: Stranded! Activity • Lab 3: Coral Reef Fish Survey Activity # • Lab 4: Desert Food Web Activity #	Organisms in Ecosystems Notes • NJCTL.com • Legends of Learning • Edpuzzle • Matter, Energy and Relationships of Organisms in Ecosystems Pacing Guide	Classwork/Homework • Labs	
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Assessments	
Formative Assessments • Daily Science Starters • Daily/Weekly Classwork & Homework Completion • Kahoot! • Rubric-for projects • Self-reflection	Summative Assessments • Quiz 1 - Ecology and Ecological Interactions • Quiz 2 - Population Dynamics and Food Webs • Test - Matter, Energy and Relationships of Organisms in Ecosystems Test
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
• Teacher's aide will read to the students as needed • Students can type or speech to text notes. • The students will be given study guides for tests • Students will be given notes for quizzes	• Provide MLL students with multiple literacy strategies. • Rosetta Stone • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.	• Teacher's aide will read to the students as needed • Students can type or speech to text notes. • Students will be given extra time to complete all assignments. • Structure lessons around questions that are authentic, relate to students' interests,	• Allow students to provide additional support for students struggling (peer teaching) • Expanded learning projects to further student understanding • Student teaching lessons • Structure lessons around questions that are authentic,

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