PITTSGROVE TOWNSHIP SCHOOL DISTRICT

Pittsgrove Township
School District
P.R.I.D.E. Patience Respect Integrity Diligence Empathy

Course Name: Science	**Grade Level(s):** 6
Department: Science	**Credits:**
BOE Adoption Date: September 17, 2020	**Revision Date(s):**

Course Description

Sixth Grade Science focuses on an integration of earth, space, life, and physical science. The goal of the middle school science program is to develop scientific literacy in all students. An effective approach to science education engages students physically and mentally in an inquiry-based laboratory program. The program must provide students with experiences that will expand, change, enhance, and modify the way in which they view and understand the world. The program intends to nurture a child's natural curiosity with a student-centered approach which emphasizes student engagement, discovery, and self-reflection and which also promotes the development of critical thinking skills. Most importantly, the program and instructional approached should instill a love of science and learning in the students that will serve them throughout their lives.

Mission Statement

The Pittsgrove Township School District believes in growing all learners to thrive. *The district offers an intellectually rigorous, dynamic curriculum aligned to state and national standards coupled with research-based practices in classrooms. The Pittsgrove Township School District strives to highlight critical thinking, problem-solving, intercultural literacy, digital literacy, collaboration, innovation, and a growth mindset as part of the instructional core of learning. The district provides high quality resources to provide young people the knowledge they need to approach the future as leaders and learners.*

Curriculum & Instruction Goals

1. To ensure students are college and career ready upon graduation
2. To vertically and horizontally align curriculum PreK-12 to ensure successful transition of students at each grade level
3. To identify individual student strengths and weaknesses utilizing various assessment measures (formative, summative, alternative, etc.) so as to differentiate instruction while meeting the rigor of the applicable content standards
4. To improve student achievement as assessed through multiple measures including, but not limited to, state testing, local assessments, and ongoing progress monitoring

How to Read this Document

This curricular document contains both a *pacing guide* and *curriculum units*. The pacing guide serves to communicate an estimated timeframe as to *when* critical knowledge and skills will be taught throughout the year. The pacing, however, may differ slightly depending upon the unique needs of each learner. The *curriculum units* contain more detailed information as to the content, goals, objectives, instructional strategies, resources, and assessments.

NJ Administrative Code and Statutes Key
^=Amistad Law **O=Diversity & Inclusion Law** **<>=Holocaust** **+=LGBT and Disabilities Law** ***=AAPI (Asian American and Pacific Islanders)** **$=Financial Literacy** **Use this key to understand where the NJ mandates are being implemented in the K-12 curriculum units.**

Pacing Guide

Course Title: Science 6
Prerequisite(s): Science 5

Unit Title	Duration/ Month(s)	Related Standards	Learning Goals	Critical Knowledge and Skills
Unit 1: Forces and Motion	**25 days**	MS-PS2-1 MS-PS2-2 MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4	● Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. ● Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. ● Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. ● Evaluate competing design solutions using a systematic process to determine how	• Apply Newton's third law to design a solution to a problem involving the motion of two colliding objects. • Define a design problem involving the motion of two colliding objects that can be solved through the development of an object, tool, process, or system and that includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. • Evaluate competing design solutions involving the motion of two colliding objects based on jointly developed and agreed-upon design criteria. • Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. • Analyze and interpret data to determine similarities and differences in findings. • Plan an investigation individually

			well they meet the criteria and constraints of the problem. ● Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. ● Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	and collaboratively to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. • Design an investigation and identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. • Make logical and conceptual connections between evidence and explanations. • Examine the changes over time and forces at different scales to explain the stability and change in designed systems.
Unit 2: Types of Interactions	**25 days**	MS-PS2-5 MS-PS2-3 MS-PS2-4	● Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. ● Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. ● Construct and present arguments using evidence	• Students will conduct an investigation and evaluate an experimental design to produce data that can serve as the basis for evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. • Students will identify the cause-and-effect relationships between fields that exist between objects and the behavior of the objects. • Students will ask questions about data to determine the effect of the

			to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	strength of electric and magnetic forces that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles. • Students will perform investigations using devices that use electromagnetic forces. • Students will collect and analyze data that could include the effect of the number of turns of wire on the strength of an electromagnet or the effect of increasing the number or strength of magnets on the speed of an electric motor. • Students construct and present oral and written arguments supported by empirical evidence and scientific reasoning to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. • Students use models to represent the gravitational interactions between two masses.
Unit 3: Astronomy	**20 days**	ESS1.B MS-ESS1- 1 ESS1.A ESS1.B	● Generate and analyze evidence (through simulations or long term investigations) to explain why the Sun's apparent	• Students will develop and use a physical, graphical, or conceptual model to describe patterns in the apparent motion of the sun, moon, and stars in the sky.

		MS-ESS1-3 MS-ESS1- 2	motion across the sky changes over the course of a year. ● 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. ● Develop and use a model that shows how gravity causes smaller objects to orbit around larger objects at increasing scales, including the gravitational force of the sun causes the planets and other bodies to orbit around it holding together the solar system. ● Analyze and interpret data to determine scale properties of objects in the solar system. ● Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	• Students develop and use models to explain the relationship between the tilt of Earth's axis and seasons. • Analyze and interpret data to determine similarities and differences among objects in the solar system.
Unit 4: Weather and Climate	**20 days**	MS-ESS2-4 MS-ESS2-5 ESS2.C ESS2.C ESS2.D MS-ESS2-6	● Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	• Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. • Model the ways water changes its state as it moves through the

			• Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. • Explain how variations in density result from variations in temperature and salinity drive a global pattern of interconnected ocean currents. • Use a model to explain the mechanisms that cause varying daily temperature ranges in a coastal community and in a community located in the interior of the country. • Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	multiple pathways of the hydrologic cycle. • Collect data to serve as the basis for evidence for how the motions and complex interactions of air masses result in changes in weather conditions. • Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
Unit 5: Growth, Development, and Reproduction	**25 days**	MS-LS1-4 MS-LS1-5	• Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal	• Collect empirical evidence about animal behaviors that affect the animals' probability of successful reproduction and also affect the probability of plant reproduction.

			behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. ● Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	• Collect empirical evidence about plant structures that are specialized for reproductive success. • Use empirical evidence from experiments and other scientific reasoning to support oral and written arguments that explain the relationship among plant structure, animal behavior, and the reproductive success of plants. • Identify and describe possible cause-and effect relationships affecting the reproductive success of plants and animals using probability. • Support or refute an explanation of how characteristic animal behaviors and specialized plant structures affect the probability of successful plant reproduction using oral and written arguments. • Conduct experiments, collect evidence, and analyze empirical data. • Use evidence from experiments and other scientific reasoning to support oral and written explanations of how environmental and genetic factors influence the growth of organisms. • Identify and describe possible causes and effects of local environmental conditions on the growth of organisms. • Identify and describe possible causes and effects of genetic

				conditions on the growth of organisms.
Unit 6: Matter and Energy in Organisms and Ecosystems	**25 days**	MS-LS2-1 MS-LS2-2 MS-LS2-3	● Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. ● Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. ● Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	• Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. • Use cause-and-effect relationships to predict the effect of resource availability on organisms and populations in natural systems. • Construct an explanation about interactions within ecosystems. • Include qualitative or quantitative relationships between variables as part of explanations about interactions within ecosystems. • Make predictions about the impact within and across ecosystems of competitive, predatory, or mutually beneficial relationships as abiotic (e.g., floods, habitat loss) or biotic (e.g., predation) components change. • Develop a model to describe the cycling of matter among living and nonliving parts of an ecosystem. • Develop a model to describe the flow of energy among living and nonliving parts of an ecosystem. Track the transfer of energy as energy flows through an ecosystem. • Observe and measure patterns of

				objects and events in ecosystems.
Unit 7: Interdependent Relationships in Ecosystems	**25 days**	MS-LS2-4 MS-LS2-5 MS-ETS1-1 MS-ETS1-3	● Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. ● Evaluate competing design solutions for maintaining biodiversity and ecosystem services. ● Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. ● Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	• Construct an argument to support or refute an explanation for the changes to populations in an ecosystem caused by disruptions to a physical or biological component of that ecosystem. Empirical evidence and scientific reasoning must support the argument. • Use scientific rules for obtaining and evaluating empirical evidence. • Recognize patterns in data and make warranted inferences about changes in populations. • Evaluate empirical evidence supporting arguments about changes to ecosystems. • Construct a convincing argument that supports or refutes claims for solutions about the natural and designed world(s). • Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. • Create design criteria for design solutions for maintaining biodiversity and ecosystem services. • Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.

<table>
<tr><th colspan="5">Instructional Unit Map</th></tr>
<tr><td colspan="5">Course Title: Science 6</td></tr>
<tr><td>Unit Title</td><td colspan="2">Forces & Motion</td><td>Start Date:</td><td>September</td></tr>
<tr><td></td><td colspan="2"></td><td>Length of Unit:</td><td>Approx. 25 days</td></tr>
<tr><td>Content Standards
What do we want them to know, understand, & do?</td><td colspan="2">MS-PS2-1 - Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.

MS-PS2-2 - Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.

MS-ETS1-1 - Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the</td><td>Learning Goals</td><td colspan="2">Students will be able to:
Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.
Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.
Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</td></tr>
</table>

	natural environment that may limit possible solutions. MS-ETS1-2 - Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS-ETS1-3 - Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-4 - Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.		
Essential Questions	● How can we predict the motion of an object? ● How can forces be manipulated to speed up or slow down a moving object? ● Why are seat belts and airbags crucial for automobiles? ● How is the overall result of a collision affected by each individual part?		

Assessments *How will we know they have gained the knowledge & skills?*	**Formative**	**Summative**	**Alternative**
	● Choral and individual responses to questioning ● Entrance/Exit Tickets ● Quizzes (paper-based and/or Google forms) ● Signals (thumbs up/down, sit/stand, and other answering strategies) ● Graded Classwork/ Homework ● Plickers Assessments ● Kahoot games/reviews ● Individual white boards ● "Brain Dump" ● Observations & informal discussions with small groups or individuals during labs ● Silent classroom polls	● End of Unit Test ● Extended Constructed Response Questions ● Project ● Lab Analysis/Conclusion ● Demonstration with explanation & fielding questions	● Student-Taught Lesson (small groups of students will teach the class) ● BrainPop Video (students create their own BrainPop-style video to explain a science phenomena) ● Advice Column (students write advice to an "anonymous friend" to help solve a scientific problem) ● Trivia Game (students create the questions and answers to be used in a review game)
Unit Pre-Assessment(s)	● Pre-Test (paper-based, Google Form, Plickers, etc.) ● Teacher-generated warm up questions with class discussion ● Individual Whiteboards (students hold up agree/disagree or short answers in response to questions or statements)		

What do they already know?	● Blind-Polling with Thumbs Up/Down (teacher asks a question or provides a vocabulary word; students close their eyes and demonstrate their comfort level with the information by indicating a thumbs up or down) ● "Four Corners" (students are given a series of statements, decide for each one the level to which they agree/disagree, and then move to the appropriate area of the classroom identified with one of the options. Students will discuss their positions with the others in their group and present their opinions to the rest of the class) ● KWL Chart (Prior learning statement as per the NJDOE's model curriculum) *By the end of Grade 5, students understand that:* ● Each force acts on one particular object and has both strength and a direction. ● An object at rest typically has multiple forces acting on it, but these forces add to give zero net force on the object. ● Forces that do not sum to zero can cause changes in the object's speed or direction of motion. ● The patterns of an object's motion in various situations can be observed and measured; when the past motion exhibits a regular pattern, future motion can be predicted from it. ● The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.
Instructional Strategies/ Student Activities	● Direct Instruction ● Scaffolding ● Guided Practice ● Cooperative learning ● Modeling ● Learning Stations ● Graphic organizers ● Note-taking sheets ● Turn and Talk / Think-Pair-Share ● Flexible grouping ● Student Choice Menu Project ● Inquiry-based learning ● RAFT assignments ● Self and Peer Review

	● Word/picture/object sorts ● Read & Think Alouds			
Instructional/Assessment Scaffolds *(Modifications /Accommodations) – planned for prior to instruction*	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**
	● Preferential seating on an as-needed basis ● Buddy with a bilingual student (if able) ● Provide key vocabulary with definitions in native language at the start of each unit ● Provide leveled reading material ● Use native language (for written directions) ● Allow use of online translator during independent work time ● Read directions aloud ● Highlight/underline key words ● Simplify language ● Single step directions ● Modify format/length of tests ● Allow oral responses ● Additional time ● Allow retakes	● Preferential seating on an as-needed basis ● Read directions aloud ● Highlight/underline key words ● Additional time ● Vary essay lengths ● Chunk projects or long-term assignments ● Read assessments aloud ● Modify format/ length of tests ● Allow oral responses ● Allow retakes ● Provide leveled reading material ● Differentiated grouping	● Preferential seating on an as-needed basis ● Read directions aloud ● Clarifying directions or conducting check-ins as needed ● Highlight/underline key words ● Additional time ● Concrete examples / examples related to personal interests or background ● Use of mnemonics ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Flexible grouping ● Provide study guides or copies of class notes prior to tests ● Allow retakes ● Chunk projects or long-term assignments ● Collaborate with after-school programs or clubs to extend learning opportunities.	● Learning stations ● Independent study ● Learning menus / Choice boards ● Virtual escape rooms (unit specific) ● Current event presentations ● Creation of presentation, video or written review of a science topic or phenomena to be posted on our classroom website and shared with peers

	● Chunk projects or long-term assignments ● Use of visual representations of concepts	● Use of visual representations of concepts ● Small group instruction ● Read test passages/articles aloud (if assessing reading comprehension) ● Provide study guides or copies of class notes		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	● Interactive Notebook/Note-taking sheet (guided notes, "doodle" notes, Cornell notes, etc.) ● Learning Stations with varied standard-based tasks ● Use of Promethean Board for discussions, visuals, note-taking, interactives, etc. ● Multi-level electronic texts (with audio capability) provided through Google Classroom ● Read & Think Alouds ● Flexible grouping ● Reteaching /Reviewing ● Targeting Different Senses Within the Lesson (verbal, video, hands-on, use of visuals, modeling/acting out, songs/chants, etc) ● Reflection & Goal-setting ● Free Study Time (student choice: reviewing of notes, completion of task cards, watching a video review,		● Student choice during formal assessment style (eliminate a certain number of questions, answer open-ended option A or B, draw a diagram or explain, etc.) ● Menu Project / Choice Board ● Individual or Small-group presentation ● Rubric/criteria for success generated by teacher and students (may be different for different individuals/groups)	

	small-group game, work completion with teacher-	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier II - law, design, solution, motion, sum, force, criteria, constraint, evaluate, data, model, analyze, interpret, balanced/unbalanced, net (adj.), variable, control, claim, evidence, reasoning, hypothesize, proportional Tier III - matter, mass, energy, collision, inertia, momentum, acceleration, thrust, gravitation, friction, air resistance, buoyancy,	
Integration of Technology <u>SAMR</u>	Substitution: ● Taking notes via Google Docs ● Typing up responses to questioning and sharing with teacher/peer ● Completing graphic organizers via Google Docs or Slides ● Completing digital worksheets via Google Forms, Docs, or Slides ● Use of online-based texts with dictionary and highlighting features ● Conducting research via Google ● Use of Google Classroom for providing and organizing materials Augmentation: ● Completing quizzes/tests via Google Forms ● Researching within Google Docs to add information and graphics to enhance notes ● Use of online-based texts with embedded videos and links to enhance understanding ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of scientific diagrams/models using Google Drawings ● Sharing videos, simulations, and other “extras” via Google Classroom to supplement notes and understanding ● Posting student created material via Padlet for sharing with peers ● Use of Quizizz or Kahoot! to review before a test Modification: ● Collaboration of students on a multimedia/slides project	

	● Peer-editing multimedia work ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of presentation, video, or written review of a science topic or phenomena posted on our classroom website ● Student completion of WebQuests ● Student participation in Digital Escape Rooms ● Plickers assessments Redefinition: ● Collaboration of students on a multimedia/slides project ● Posting, reviewing, and commenting on student created material via Padlet ● Student-Created and Student-Taught Lesson with multimedia presentation ● Use of Quizizz or Kahoot! to review before a test ● Plickers assessments
Interdisciplinary Connections NJ Student Learning Standards	*English Language Arts/Literacy* ● Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions of the application of Newton's third law involving the motion of two colliding objects. ● Follow precisely a multistep procedure when carrying out experiments to apply Newton's third law when designing a solution to a problem involving the motion of two colliding objects, taking measurements, or performing technical tasks. ● Follow precisely a multistep procedure when performing an investigation that provides evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object, taking measurements or performing technical tasks. ● Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading texts about the application of Newton's third law to the motion of two colliding objects Conduct a short research project to answer a question about the application of Newton's third law when designing a solution to a problem involving the motion of two colliding objects, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. ● Conduct a short research project to answer a question about how the sum of the forces on the object and the mass of the object change an object's motion, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

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- Gather relevant information from multiple print and digital sources that provide information about the application of Newton's third law when designing a solution to a problem involving the motion of two colliding objects; assess the credibility of each source and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.
- Draw evidence from informational texts to support analysis, reflection, and research about the application of Newton's third law when designing a solution to a problem involving the motion of two colliding objects.

Mathematics

- Reason abstractly and quantitatively when collecting and analyzing data about the application of Newton's third law in the course of designing a solution to a problem involving the motion of two colliding objects.
- Analyze data in the form of numbers and symbols to draw conclusions about how the sum of the forces on an object and the mass of an object change the object's motion.
- Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in a design that applies Newton's third law to a problem involving the motion of two colliding objects.
- When collecting and analyzing data from investigations about how the sum of the forces on an object and the mass of the object changes the object's motion, write, read, and evaluate expressions in which letters stand for numbers.

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<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td>

Global Awareness:

- Using 21st Century Skills to understand and address global issues

Environmental Literacy:

- Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems.

</td><td>

Life and Career Skills

- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

Learning and Innovation Skills

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

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	• Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.). • Investigate and analyze environmental issues, and make accurate conclusions about effective solutions. • Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).	Information, Media, and Technology Skills • Information Literacy • Media Literacy • Information Communication Technology Literacy
Resources/ Materials	• PhET Simulations (https://phet.colorado.edu/en/simulations/filter?sort=alpha&view=grid) - "Forces and Motion: Basics", "Friction" • Gizmos Simulations (https://www.explorelearning.com/) - "Force and Fan Carts" • Discovery Education (https://www.discoveryeducation.com/) • Scholastic Super Science Magazine (https://superscience.scholastic.com/) • ReadWorks (https://www.readworks.org) • PBS Learning Media (https://www.pbslearningmedia.org/) • CK-12 (https://www.ck12.org/) • BrainPop (https://www.brainpop.com/) • CrashCourseKids (https://www.youtube.com/user/crashcoursekids) • StudyJams! (https://studyjams.scholastic.com/studyjams/) • Teacher Generated Materials • Learning Stations • Task Cards • "Newton's First Law" Inquiry Lab • "Newton's Third Law" Inquiry Lab	

<table>
<tr><th colspan="5">Instructional Unit Map</th></tr>
<tr><td colspan="5">Course Title: Science 6</td></tr>
<tr><td>Unit Title</td><td colspan="2">Types of Interactions</td><td>Start Date:</td><td>November</td></tr>
<tr><td></td><td colspan="2"></td><td>Length of Unit:</td><td>Approx. 25 days</td></tr>
<tr><td>Content Standards
What do we want them to know, understand, & do?</td><td>MS-PS2-5 - Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

MS-PS2-3 - Ask questions about data to determine the</td><td>Learning Goals</td><td colspan="2">Students will be able to:
Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.</td></tr>
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	factors that affect the strength of electric and magnetic forces. MS-PS2-4 - Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.		
Essential Questions	How is it possible to exert a force on an object without touching it? Why do some objects exert a stronger force than others?		
Assessments *How will we know they have gained the knowledge & skills?*	**Formative**	**Summative**	**Alternative**
	● Choral and individual responses to questioning ● Entrance/Exit Tickets ● Quizzes (paper-based and/or Google forms) ● Signals (thumbs up/down, sit/stand, and other answering strategies) ● Graded Classwork/ Homework ● Plickers Assessments ● Kahoot games/reviews ● Individual white boards ● "Brain Dump" ● Observations & informal discussions with small	● End of Unit Test ● Extended Constructed Response Questions ● Project ● Lab Analysis/Conclusion ● Demonstration with explanation & fielding questions	● Student-Taught Lesson (small groups of students will teach the class) ● BrainPop Video (students create their own BrainPop-style video to explain a science phenomena) ● Advice Column (students write advice to an

	groups or individuals during labs ● Silent classroom polls		"anonymous friend" to help solve a scientific problem) ● Trivia Game (students create the questions and answers to be used in a review game)
Unit Pre-Assessment(s) *What do they already know?*	● Pre-Test (paper-based, Google Form, Plickers, etc.) ● Teacher-generated warm up questions with class discussion ● Individual Whiteboards (students hold up agree/disagree or short answers in response to questions or statements) ● Blind-Polling with Thumbs Up/Down (teacher asks a question or provides a vocabulary word; students close their eyes and demonstrate their comfort level with the information by indicating a thumbs up or down) ● "Four Corners" (students are given a series of statements, decide for each one the level to which they agree/disagree, and then move to the appropriate area of the classroom identified with one of the options. Students will discuss their positions with the others in their group and present their opinions to the rest of the class) ● KWL Chart (Prior learning statement as per the NJDOE's model curriculum) *By the end of Grade 5, students understand that:* ● Objects in contact exert forces on each other. ● Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. ● The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.		
Instructional	● Direct Instruction ● Scaffolding		

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<tr><td>Strategies/ Student Activities</td><td colspan="4">● Guided Practice
● Cooperative learning
● Modeling
● Learning Stations
● Graphic organizers
● Note-taking sheets
● Turn and Talk / Think-Pair-Share
● Flexible grouping
● Student Choice Menu Project
● Inquiry-based learning
● RAFT assignments
● Self and Peer Review
● Word/picture/object sorts
● Read & Think Alouds</td></tr>
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	● Allow use of online translator during independent work time ● Read directions aloud ● Highlight/underline key words ● Simplify language ● Single step directions ● Modify format/length of tests ● Allow oral responses ● Additional time ● Allow retakes ● Chunk projects or long-term assignments ● Use of visual representations of concepts	● Read assessments aloud ● Modify format/ length of tests ● Allow oral responses ● Allow retakes ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Small group instruction ● Read test passages/articles aloud (if assessing reading comprehension) ● Provide study guides or copies of class notes	● Use of visual representations of concepts ● Flexible grouping ● Provide study guides or copies of class notes prior to tests ● Allow retakes ● Chunk projects or long-term assignments ● Collaborate with after-school programs or clubs to extend learning opportunities.	review of a science topic or phenomena to be posted on our classroom website and shared with peers
Differentiated Instructional Methods:	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	● Interactive Notebook/Note-taking sheet (guided notes, “doodle” notes, Cornell notes, etc.) ● Learning Stations with varied standard-based tasks ● Use of Promethean Board for discussions, visuals, note-taking, interactives, etc.		● Student choice during formal assessment style (eliminate a certain number of questions, answer open-ended option A or B, draw a diagram or explain, etc.) ● Menu Project / Choice Board ● Individual or Small-group presentation	

(Multiple means for students to access content and multiple modes for student to express understanding)	● Multi-level electronic texts (with audio capability) provided through Google Classroom ● Read & Think Alouds ● Flexible grouping ● Reteaching /Reviewing ● Targeting Different Senses Within the Lesson (verbal, video, hands-on, use of visuals, modeling/acting out, songs/chants, etc) ● Reflection & Goal-setting ● Free Study Time (student choice: reviewing of notes, completion of task cards, watching a video review, small-group game, work completion with teacher-	● Rubric/criteria for success generated by teacher and students (may be different for different individuals/groups)
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier II - design, solution, force, criteria, constraint, evaluate, data, model, analyze, interpret, variable, control, claim, evidence, reasoning, hypothesize, proportional Tier III - magnetic field, electrical charges, static electricity, static discharge, proton, neutron, electron, atom, electromagnet, generator, gravitational/gravity, mass	
Integration of Technology <u>SAMR</u>	Substitution: ● Taking notes via Google Docs ● Typing up responses to questioning and sharing with teacher/peer ● Completing graphic organizers via Google Docs or Slides ● Completing digital worksheets via Google Forms, Docs, or Slides ● Use of online-based texts with dictionary and highlighting features ● Conducting research via Google ● Use of Google Classroom for providing and organizing materials Augmentation:	

	● Completing quizzes/tests via Google Forms ● Researching within Google Docs to add information and graphics to enhance notes ● Use of online-based texts with embedded videos and links to enhance understanding ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of scientific diagrams/models using Google Drawings ● Sharing videos, simulations, and other "extras" via Google Classroom to supplement notes and understanding ● Posting student created material via Padlet for sharing with peers ● Use of Quizizz or Kahoot! to review before a test Modification: ● Collaboration of students on a multimedia/slides project ● Peer-editing multimedia work ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of presentation, video, or written review of a science topic or phenomena posted on our classroom website ● Student completion of WebQuests ● Student participation in Digital Escape Rooms ● Plickers assessments Redefinition: ● Collaboration of students on a multimedia/slides project ● Posting, reviewing, and commenting on student created material via Padlet ● Student-Created and Student-Taught Lesson with multimedia presentation ● Use of Quizizz or Kahoot! to review before a test ● Plickers assessments
Interdisciplinary Connections	*English Language Arts/Literacy* ● Cite specific textual evidence to support analysis of information about science and technical texts regarding *the factors that affect the strength of electric and magnetic forces,* attending to the precise details of explanations or descriptions. ● Write arguments focused on evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

<table>
<tr><td>NJ Student Learning Standards</td><td colspan="2">Mathematics
Reason abstractly and quantitatively while using data to determine the factors that affect the strength of electric and magnetic forces.</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td><u>Global Awareness:</u>
Using 21st Century Skills to understand and address global issues
<u>Environmental Literacy:</u>
Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems.
Demonstrate knowledge and understanding of society’s impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.).
Investigate and analyze environmental issues, and make accurate conclusions about effective solutions.
Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).</td><td>Life and Career Skills
Flexibility and Adaptability
Initiative and Self-Direction
Social and Cross-Cultural Skills
Productivity and Accountability
Leadership and Responsibility
Learning and Innovation Skills
Creativity and Innovation
Critical Thinking and Problem Solving
Communication and Collaboration
Information, Media, and Technology Skills
Information Literacy
Media Literacy
Information Communication Technology Literacy</td></tr>
</table>

Resources/ Materials	● PhET Simulations (https://phet.colorado.edu/en/simulations/filter?sort=alpha&view=grid) - “Balloons & Static Electricity”, “John Travoltage”, “Magnet and Compass”, ● Gizmos Simulations (https://www.explorelearning.com/) - “Circuit Builder” ● Discovery Education (https://www.discoveryeducation.com/) ● Scholastic Super Science Magazine (https://superscience.scholastic.com/) ● ReadWorks (https://www.readworks.org) ● PBS Learning Media (https://www.pbslearningmedia.org/) ● CK-12 (https://www.ck12.org/) ● “Inspector Detector Challenge” (https://www.pbslearningmedia.org/resource/mss13.sci.engin.design.detect/inspector-detector-challenge/#.XuLgfhNKhE4) ● “Electromagnetic Power”(https://www.regent.edu/acad/schedu/pdfs/mcms/electromagnetic_power.pdf” ● BrainPop (https://www.brainpop.com/) ● CrashCourseKids (https://www.youtube.com/user/crashcoursekids) ● StudyJams! (https://studyjams.scholastic.com/studyjams/) ● Teacher Generated Materials ● Learning Stations ● Task Cards

Instructional Unit Map					
Course Title: Science 6					
Unit Title	Astronomy			**Start Date:**	January
				Length of Unit:	20 days
Content Standards *What do we want them to*	MS-ESS1- 1 - Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases,	**Learning Goals**	Students will be able to: ● Generate and analyze evidence (through simulations or long term investigations) to explain why the Sun’s apparent motion across the sky changes over the course of a year.		

know, understand , & do?	eclipses of the sun and moon, and seasons. MS-ESS1-3 - Analyze and interpret data to determine scale properties of objects in the solar system. MS-ESS1- 2 - Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.		• 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. • Develop and use a model that shows how gravity causes smaller objects to orbit around larger objects at increasing scales, including the gravitational force of the sun causes the planets and other bodies to orbit around it holding together the solar system. • Analyze and interpret data to determine scale properties of objects in the solar system. • Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
Essential Questions	• *How do patterns within the Earth–sun–moon affect life on Earth?* • *What is the role of gravity in the motions within galaxies and the solar system?* • *How do we study a system that is too large to observe in its entirety?*		
Assessments *How will we know they have gained the knowledge & skills?*	**Formative**	**Summative**	**Alternative**
	• Choral and individual responses to questioning • Entrance/Exit Tickets • Quizzes (paper-based and/or Google forms) • Signals (thumbs up/down, sit/stand, and other answering strategies) • Graded Classwork/ Homework • Plickers Assessments • Kahoot games/reviews • Individual white boards • “Brain Dump”	• End of Unit Test • Extended Constructed Response Questions • Project • Lab Analysis/Conclusion • Demonstration with explanation & fielding questions	• Student-Taught Lesson (small groups of students will teach the class) • BrainPop Video (students create their own BrainPop-style video to explain a science phenomena)

	• Observations & informal discussions with small groups or individuals during labs • Silent classroom polls		• Advice Column (students write advice to an "anonymous friend" to help solve a scientific problem) • Trivia Game (students create the questions and answers to be used in a review game)
Unit Pre-Assessment(s) *What do they already know?*	• Pre-Test (paper-based, Google Form, Plickers, etc.) • Teacher-generated warm up questions with class discussion • Individual Whiteboards (students hold up agree/disagree or short answers in response to questions or statements) • Blind-Polling with Thumbs Up/Down (teacher asks a question or provides a vocabulary word; students close their eyes and demonstrate their comfort level with the information by indicating a thumbs up or down) • "Four Corners" (students are given a series of statements, decide for each one the level to which they agree/disagree, and then move to the appropriate area of the classroom identified with one of the options. Students will discuss their positions with the others in their group and present their opinions to the rest of the class) • KWL Chart (Prior learning statement as per the NJDOE's model curriculum) *By the end of Grade 5, students understand that:* • Earth's orbit and rotation and the orbit of the moon around Earth cause observable patterns. • Certain features on Earth can be used to order events that have occurred in a landscape.		
Instructional	• Direct Instruction • Scaffolding		

<table>
<tr><td>Strategies/ Student Activities</td><td colspan="4">● Guided Practice
● Cooperative learning
● Modeling
● Learning Stations
● Graphic organizers
● Note-taking sheets
● Turn and Talk / Think-Pair-Share
● Flexible grouping
● Student Choice Menu Project
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Differentiated Instructional Methods:	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
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(Multiple means for students to access content and multiple modes for student to express understanding)	● Multi-level electronic texts (with audio capability) provided through Google Classroom ● Read & Think Alouds ● Flexible grouping ● Reteaching /Reviewing ● Targeting Different Senses Within the Lesson (verbal, video, hands-on, use of visuals, modeling/acting out, songs/chants, etc) ● Reflection & Goal-setting ● Free Study Time (student choice: reviewing of notes, completion of task cards, watching a video review, small-group game, work completion with teacher-	● Rubric/criteria for success generated by teacher and students (may be different for different individuals/groups)
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier II - analyze, claim, evidence, reasoning, model, scaled model, scale properties, cyclic pattern, engineer (verb), rotation, revolve, design, solution, force, criteria, constraint, evaluate, data, model, analyze, interpret, proportional Tier III - Earth-Sun-Moon System, lunar phase, eclipse, gravitation/gravity, orbit, galaxy, solar system, axis, axial tilt, density, solstice, equinox, matter, mass, satellite	
Integration of Technology <u>SAMR</u>	Substitution: ● Taking notes via Google Docs ● Typing up responses to questioning and sharing with teacher/peer ● Completing graphic organizers via Google Docs or Slides ● Completing digital worksheets via Google Forms, Docs, or Slides ● Use of online-based texts with dictionary and highlighting features ● Conducting research via Google ● Use of Google Classroom for providing and organizing materials Augmentation:	

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Interdisciplinary Connections	*English Language Arts/Literacy* ● Include multimedia components and visual displays in presentations to describe the cyclical patterns of lunar phases, eclipses of the sun and moon, seasons, and the role of gravity in the motions within galaxies and the solar system. The presentation needs to clarify claims and findings and emphasize salient points.

<table>
<tr><td>NJ Student Learning Standards</td><td colspan="2">

Cite specific textual evidence to support analysis of science and technical text about scale properties of objects in the solar system.
Integrate quantitative or technical information expressed in words in a text about scale properties of objects in the solar system with a version of that information expressed visually in a flowchart, diagram, model, graph, or table.

Mathematics

Reason quantitatively and abstractly about the sizes of an object’s layers, surface features, and orbital radius where appropriate.
Use mathematics to model the motion of the sun, moon, and stars in the sky and the role of gravity in the motions within galaxies and the solar system.
Understand the concept of a ratio and use ratio language to describe a ratio relationship between the measurements of the cyclical motion between at least two bodies in the solar system and the relative sizes of objects and/or distances between objects and the impact of gravity on the motion of these objects.
Recognize and represent proportional relationships between the measurement of patterns in the cyclical motion of the sun, moon, and stars in the sky and mathematical proportions relative to the sizes of objects and the effect of gravity on the motion of these objects.
Use variables to represent numbers and write expressions when solving a problem involving the role of gravity in the motions within galaxies and within the solar system. Understand that a variable can represent an unknown number, or depending on the problem, any number in a specified set.

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<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td><u>Global Awareness:</u>

Using 21st Century Skills to understand and address global issues

<u>Environmental Literacy:</u>

Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems.

</td><td>Life and Career Skills

Flexibility and Adaptability
Initiative and Self-Direction
Social and Cross-Cultural Skills
Productivity and Accountability
Leadership and Responsibility

Learning and Innovation Skills

Creativity and Innovation

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	• Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.). • Investigate and analyze environmental issues, and make accurate conclusions about effective solutions. • Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).	• Critical Thinking and Problem Solving • Communication and Collaboration Information, Media, and Technology Skills • Information Literacy • Media Literacy • Information Communication Technology Literacy
Resources/ Materials	• PhET Simulations (https://phet.colorado.edu/en/simulations/filter?sort=alpha&view=grid) - "Gravity and Orbits", • Gizmos Simulations (https://www.explorelearning.com/) - "Summer and Winter" • Discovery Education (https://www.discoveryeducation.com/) • Scholastic Super Science Magazine (https://superscience.scholastic.com/) • ReadWorks (https://www.readworks.org) • PBS Learning Media (https://www.pbslearningmedia.org/) • CK-12 (https://www.ck12.org/) • SEPUP Seasons Interactive (https://sepuplhs.org/middle/iaes/students/simulations/sepup_seasons5.html) • BrainPop (https://www.brainpop.com/) • CrashCourseKids (https://www.youtube.com/user/crashcoursekids) • StudyJams! (https://studyjams.scholastic.com/studyjams/) • Teacher Generated Materials • Learning Stations • Task Cards • "Seasons" Inquiry Lab • "Scale Properties of Space Objects" Inquiry Lab	

<table>
<tr><th colspan="5">Instructional Unit Map</th></tr>
<tr><td colspan="5">Course Title: Science 6</td></tr>
<tr><td>Unit Title</td><td colspan="2">Weather & Climate</td><td>Start Date:</td><td>February</td></tr>
<tr><td></td><td colspan="2"></td><td>Length of Unit:</td><td>Approx 20 days</td></tr>
<tr><td>Content Standards
What do we want them to know, understand , & do?</td><td colspan="2">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</td><td>Learning Goals</td><td colspan="2">Students will be able to:
Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
Explain how variations in density result from variations in temperature and salinity drive a global pattern of interconnected ocean currents.
Use a model to explain the mechanisms that cause varying daily temperature ranges in a coastal community and in a community located in the interior of the country.
Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.</td></tr>
</table>

	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 that determine regional climates.		
Essential Questions	● *What are the processes involved in the cycling of water through Earth's systems?* ● *What is the relationship between the complex interactions of air masses and changes in weather conditions?* ● *What are the major factors that determine regional climates around the world?*		
Assessments *How will we know they have gained the knowledge & skills?*	**Formative**	**Summative**	**Alternative**
	● Choral and individual responses to questioning ● Entrance/Exit Tickets ● Quizzes (paper-based and/or Google forms) ● Signals (thumbs up/down, sit/stand, and other answering strategies) ● Graded Classwork/ Homework ● Plickers Assessments ● Kahoot games/reviews ● Individual white boards ● "Brain Dump" ● Observations & informal discussions with small groups or individuals during labs ● Silent classroom polls	● End of Unit Test ● Extended Constructed Response Questions ● Project ● Lab Analysis/Conclusion ● Demonstration with explanation & fielding questions	● Student-Taught Lesson (small groups of students will teach the class) ● BrainPop Video (students create their own BrainPop-style video to explain a science phenomena) ● Advice Column (students write advice to an "anonymous friend" to help

			solve a scientific problem) ● Trivia Game (students create the questions and answers to be used in a review game)
Unit Pre-Assessment(s) *What do they already know?*	● Pre-Test (paper-based, Google Form, Plickers, etc.) ● Teacher-generated warm up questions with class discussion ● Individual Whiteboards (students hold up agree/disagree or short answers in response to questions or statements) ● Blind-Polling with Thumbs Up/Down (teacher asks a question or provides a vocabulary word; students close their eyes and demonstrate their comfort level with the information by indicating a thumbs up or down) ● "Four Corners" (students are given a series of statements, decide for each one the level to which they agree/disagree, and then move to the appropriate area of the classroom identified with one of the options. Students will discuss their positions with the others in their group and present their opinions to the rest of the class) ● KWL Chart (Prior learning statement as per the NJDOE's model curriculum) *By the end of Grade 5, students understand that:* ● Most of the Earth's water is in the ocean, and much of the Earth's fresh water is in glaciers or underground. ● Climate describes patterns of typical weather conditions over different scales and variations. ● Historical weather patterns can be analyzed.		
Instructional Strategies/ Student Activities	● Direct Instruction ● Scaffolding ● Guided Practice ● Cooperative learning ● Modeling ● Learning Stations		

	● Graphic organizers ● Note-taking sheets ● Turn and Talk / Think-Pair-Share ● Flexible grouping ● Student Choice Menu Project ● Inquiry-based learning ● RAFT assignments ● Self and Peer Review ● Word/picture/object sorts ● Read & Think Alouds			
Instructional/Assessment Scaffolds *(Modifications /Accommodations) – planned for prior to instruction*	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**
	● Preferential seating on an as-needed basis ● Buddy with a bilingual student (if able) ● Provide key vocabulary with definitions in native language at the start of each unit ● Provide leveled reading material ● Use native language (for written directions) ● Allow use of online translator during independent work time ● Read directions aloud	● Preferential seating on an as-needed basis ● Read directions aloud ● Highlight/underline key words ● Additional time ● Vary essay lengths ● Chunk projects or long-term assignments ● Read assessments aloud ● Modify format/ length of tests	● Preferential seating on an as-needed basis ● Read directions aloud ● Clarifying directions or conducting check-ins as needed ● Highlight/underline key words ● Additional time ● Concrete examples / examples related to personal interests or background ● Use of mnemonics ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Flexible grouping ● Provide study guides or copies of class notes prior to tests	● Learning stations ● Independent study ● Learning menus / Choice boards ● Virtual escape rooms (unit specific) ● Current event presentations ● Creation of presentation, video or written review of a science topic or phenomena to be posted on our

	● Highlight/underline key words ● Simplify language ● Single step directions ● Modify format/length of tests ● Allow oral responses ● Additional time ● Allow retakes ● Chunk projects or long-term assignments ● Use of visual representations of concepts	● Allow oral responses ● Allow retakes ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Small group instruction ● Read test passages/articles aloud (if assessing reading comprehension) ● Provide study guides or copies of class notes	● Allow retakes ● Chunk projects or long-term assignments ● Collaborate with after-school programs or clubs to extend learning opportunities.	classroom website and shared with peers
Differentiated Instructional Methods: *(Multiple means for students to access content and*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
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Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier II - model, cycle, energy, data, claim, evidence, reasoning, density, rotation, model, pattern, design, solution, force, criteria, constraint, evaluate, model, analyze, interpret, proportional, latitude, altitude, geography, circulation, probability, climate Tier III - gravitation/gravity, hydrologic cycle, air mass, air pressure, humidity, precipitation, meteorology, salinity, atmosphere, atmospheric conditions, convection currents, Coriolis effect, evaporation, transpiration, condensation	
Integration of Technology <u>SAMR</u>	Substitution: ● Taking notes via Google Docs ● Typing up responses to questioning and sharing with teacher/peer ● Completing graphic organizers via Google Docs or Slides ● Completing digital worksheets via Google Forms, Docs, or Slides ● Use of online-based texts with dictionary and highlighting features ● Conducting research via Google ● Use of Google Classroom for providing and organizing materials Augmentation: ● Completing quizzes/tests via Google Forms ● Researching within Google Docs to add information and graphics to enhance notes ● Use of online-based texts with embedded videos and links to enhance understanding ● Using Gizmos, Phet, and other virtual labs/simulations	

	● Creation of scientific diagrams/models using Google Drawings ● Sharing videos, simulations, and other "extras" via Google Classroom to supplement notes and understanding ● Posting student created material via Padlet for sharing with peers ● Use of Quizizz or Kahoot! to review before a test Modification: ● Collaboration of students on a multimedia/slides project ● Peer-editing multimedia work ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of presentation, video, or written review of a science topic or phenomena posted on our classroom website ● Student completion of WebQuests ● Student participation in Digital Escape Rooms ● Plickers assessments Redefinition: ● Collaboration of students on a multimedia/slides project ● Posting, reviewing, and commenting on student created material via Padlet ● Student-Created and Student-Taught Lesson with multimedia presentation ● Use of Quizizz or Kahoot! to review before a test ● Plickers assessments
Interdisciplinary Connections NJ Student Learning Standards	*English Language Arts/Literacy* ● Support the analysis of science and technical texts by citing specific textual evidence for how the motions and complex interactions of air masses result in changes in weather conditions. ● Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with information that is gained from reading text about how the complex patterns of the changes and movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents are major determinants of local weather patterns. ● Gather relevant information from multiple print and digital sources about how the complex patterns of the changes and movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major

<table>
<tr><td></td><td colspan="2">determinants of local weather patterns; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.
● Include multimedia components and visual displays in presentations to clarify information about how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

Mathematics

● Reason abstractly and quantitatively by using data such as weather maps, diagrams, and visualizations or obtained through laboratory experiments to predict weather within probabilities ranges.
● Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. Use positive and negative numbers to represent changes in atmospheric and oceanic temperatures, explaining the meaning of 0 in each situation.</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td><u>Global Awareness:</u>
● Using 21st Century Skills to understand and address global issues

<u>Environmental Literacy:</u>
● Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems.

● Demonstrate knowledge and understanding of society’s impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.).

● Investigate and analyze environmental issues, and make accurate conclusions about effective solutions.</td><td>Life and Career Skills
● Flexibility and Adaptability
● Initiative and Self-Direction
● Social and Cross-Cultural Skills
● Productivity and Accountability
● Leadership and Responsibility

Learning and Innovation Skills
● Creativity and Innovation
● Critical Thinking and Problem Solving
● Communication and Collaboration

Information, Media, and Technology Skills
● Information Literacy
● Media Literacy
● Information Communication Technology Literacy</td></tr>
</table>

	• Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).	
Resources/ Materials	• PhET Simulations (https://phet.colorado.edu/en/simulations/filter?sort=alpha&view=grid) - "The Greenhouse Effect" • Gizmos Simulations (https://www.explorelearning.com/) - "Observing Weather", "Comparing Climates", "Water Cycle", "Convection Cells" • Discovery Education (https://www.discoveryeducation.com/) • Scholastic Super Science Magazine (https://superscience.scholastic.com/) • ReadWorks (https://www.readworks.org) • PBS Learning Media (https://www.pbslearningmedia.org/) • CK-12 (https://www.ck12.org/) • Currents and the Great Ducky Spill (https://betterlesson.com/lesson/631913/currents-and-the-great-ducky-spill) • BrainPop (https://www.brainpop.com/) • CrashCourseKids (https://www.youtube.com/user/crashcoursekids) • StudyJams! (https://studyjams.scholastic.com/studyjams/) • Teacher Generated Materials • Learning Stations • Task Cards • "Convection" Inquiry Lab • "Water Cycle" Inquiry Lab	

<table>
<tr><th colspan="5">Instructional Unit Map</th></tr>
<tr><td colspan="5">Course Title: Science 6</td></tr>
<tr><td>Unit Title</td><td colspan="2">Growth, Development & Reproduction of Organisms</td><td>Start Date:</td><td>March</td></tr>
<tr><td></td><td colspan="2"></td><td>Length of Unit:</td><td>Approx. 25 days</td></tr>
<tr><td>Content Standards
What do we want them to know, understand , & do?</td><td colspan="2">MS-LS1-4 - Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

MS-LS1-5 - Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.</td><td>Learning Goals</td><td colspan="2">Students will be able to:
● Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
● Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.</td></tr>
<tr><td>Essential Questions</td><td colspan="4">● How can the behaviors and structures of plants and animals affect their ability to successfully reproduce?
● How do environmental and genetic factors influence the growth of organisms?</td></tr>
<tr><td>Assessments</td><td>Formative</td><td colspan="2">Summative</td><td>Alternative</td></tr>
</table>

How will we know they have gained the knowledge & skills?	• Choral and individual responses to questioning • Entrance/Exit Tickets • Quizzes (paper-based and/or Google forms) • Signals (thumbs up/down, sit/stand, and other answering strategies) • Graded Classwork/ Homework • Plickers Assessments • Kahoot games/reviews • Individual white boards • "Brain Dump" • Observations & informal discussions with small groups or individuals during labs • Silent classroom polls	• End of Unit Test • Extended Constructed Response Questions • Project • Lab Analysis/Conclusion • Demonstration with explanation & fielding questions	• Student-Taught Lesson (small groups of students will teach the class) • BrainPop Video (students create their own BrainPop-style video to explain a science phenomena) • Advice Column (students write advice to an "anonymous friend" to help solve a scientific problem) • Trivia Game (students create the questions and answers to be used in a review game)
Unit Pre-Assessment(s) *What do they*	• Pre-Test (paper-based, Google Form, Plickers, etc.) • Teacher-generated warm up questions with class discussion • Individual Whiteboards (students hold up agree/disagree or short answers in response to questions or statements) • Blind-Polling with Thumbs Up/Down (teacher asks a question or provides a vocabulary word; students close their eyes and demonstrate their comfort level with the information by indicating a thumbs up or down)		

already know?	● "Four Corners" (students are given a series of statements, decide for each one the level to which they agree/disagree, and then move to the appropriate area of the classroom identified with one of the options. Students will discuss their positions with the others in their group and present their opinions to the rest of the class) ● KWL Chart (Prior learning statement as per the NJDOE's model curriculum) *By the end of Grade 5, students understand that:* ● Reproduction is essential to every kind of organism. ● Organisms have unique and diverse life cycles. ● Organisms have both internal and macroscopic structures that allow for growth, survival, behavior, and reproduction.			
Instructional Strategies/ Student Activities	● Direct Instruction ● Scaffolding ● Guided Practice ● Cooperative learning ● Modeling ● Learning Stations ● Graphic organizers ● Note-taking sheets ● Turn and Talk / Think-Pair-Share ● Flexible grouping ● Student Choice Menu Project ● Inquiry-based learning ● RAFT assignments ● Self and Peer Review ● Word/picture/object sorts ● Read & Think Alouds			
Instructional/Assessment Scaffolds	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**

(Modifications /Accommodations) – planned for prior to instruction	● Preferential seating on an as-needed basis ● Buddy with a bilingual student (if able) ● Provide key vocabulary with definitions in native language at the start of each unit ● Provide leveled reading material ● Use native language (for written directions) ● Allow use of online translator during independent work time ● Read directions aloud ● Highlight/underline key words ● Simplify language ● Single step directions ● Modify format/length of tests ● Allow oral responses ● Additional time ● Allow retakes ● Chunk projects or long-term assignments ● Use of visual representations of concepts	● Preferential seating on an as-needed basis ● Read directions aloud ● Highlight/underline key words ● Additional time ● Vary essay lengths ● Chunk projects or long-term assignments ● Read assessments aloud ● Modify format/ length of tests ● Allow oral responses ● Allow retakes ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Small group instruction ● Read test passages/articles	● Preferential seating on an as-needed basis ● Read directions aloud ● Clarifying directions or conducting check-ins as needed ● Highlight/underline key words ● Additional time ● Concrete examples / examples related to personal interests or background ● Use of mnemonics ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Flexible grouping ● Provide study guides or copies of class notes prior to tests ● Allow retakes ● Chunk projects or long-term assignments ● Collaborate with after-school programs or clubs to extend learning opportunities.	● Learning stations ● Independent study ● Learning menus / Choice boards ● Virtual escape rooms (unit specific) ● Current event presentations ● Creation of presentation, video or written review of a science topic or phenomena to be posted on our classroom website and shared with peers

		aloud (if assessing reading comprehension) ● Provide study guides or copies of class notes		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	● Interactive Notebook/Note-taking sheet (guided notes, "doodle" notes, Cornell notes, etc.) ● Learning Stations with varied standard-based tasks ● Use of Promethean Board for discussions, visuals, note-taking, interactives, etc. ● Multi-level electronic texts (with audio capability) provided through Google Classroom ● Read & Think Alouds ● Flexible grouping ● Reteaching /Reviewing ● Targeting Different Senses Within the Lesson (verbal, video, hands-on, use of visuals, modeling/acting out, songs/chants, etc) ● Reflection & Goal-setting ● Free Study Time (student choice: reviewing of notes, completion of task cards, watching a video review, small-group game, work completion with teacher-		● Student choice during formal assessment style (eliminate a certain number of questions, answer open-ended option A or B, draw a diagram or explain, etc.) ● Menu Project / Choice Board ● Individual or Small-group presentation ● Rubric/criteria for success generated by teacher and students (may be different for different individuals/groups)	
Vocabulary *Highlight key vocabulary*	Tier II - claim, evidence, reasoning, probability, construct, trait, characteristic, inherited, innate, acquired, data, observe, analyze, criteria, constraint, evaluate,			

(both Tier II and Tier III words)	Tier III - organism, animal behaviors, specialized plant structures, reproduction, environmental factors, genetic factors, camouflage, mimicry, adaptation, natural selection, ecosystem, habitat, predator, prey, predation, species, population, biotic, abiotic
Integration of Technology <u>SAMR</u>	Substitution: ● Taking notes via Google Docs ● Typing up responses to questioning and sharing with teacher/peer ● Completing graphic organizers via Google Docs or Slides ● Completing digital worksheets via Google Forms, Docs, or Slides ● Use of online-based texts with dictionary and highlighting features ● Conducting research via Google ● Use of Google Classroom for providing and organizing materials Augmentation: ● Completing quizzes/tests via Google Forms ● Researching within Google Docs to add information and graphics to enhance notes ● Use of online-based texts with embedded videos and links to enhance understanding ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of scientific diagrams/models using Google Drawings ● Sharing videos, simulations, and other "extras" via Google Classroom to supplement notes and understanding ● Posting student created material via Padlet for sharing with peers ● Use of Quizizz or Kahoot! to review before a test Modification: ● Collaboration of students on a multimedia/slides project ● Peer-editing multimedia work ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of presentation, video, or written review of a science topic or phenomena posted on our classroom website ● Student completion of WebQuests ● Student participation in Digital Escape Rooms ● Plickers assessments

<table>
<tr><td></td><td colspan="2">Redefinition:
● Collaboration of students on a multimedia/slides project
● Posting, reviewing, and commenting on student created material via Padlet
● Student-Created and Student-Taught Lesson with multimedia presentation
● Use of Quizizz or Kahoot! to review before a test
● Plickers assessments</td></tr>
<tr><td>Interdisciplinary Connections
<u>NJ Student Learning Standards</u></td><td colspan="2">English Language Arts/Literacy
● Cite specific, empirical, textual evidence to support analysis of how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.
● Trace and evaluate the argument and specific claims in a text about how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively. Distinguish claims that are supported by empirical evidence and scientific reasoning from claims that are not.
● Write an argument focused on how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.

Mathematics
● Understand that a set of data collected to answer a statistical question about how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively, has a distribution which can be described by its center (mean), spread (range), and overall shape (shape of the distribution of data).
● Summarize numerical data sets, collected to answer a statistical question about how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively, that have a distribution that can be described by its center (mean), spread (range), and overall shape (shape of the distribution of data) in relation to their context.</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills</td><td>Themes</td><td>Skills</td></tr>
<tr><td><u>Global Awareness:</u>
● Using 21st Century Skills to understand and address global issues</td><td>Life and Career Skills
● Flexibility and Adaptability</td></tr>
</table>

<table>
<tr>
<td>P21 Framework</td>
<td><u>Environmental Literacy:</u>
● Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems.

● Demonstrate knowledge and understanding of society’s impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.).

● Investigate and analyze environmental issues, and make accurate conclusions about effective solutions.

● Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).</td>
<td>● Initiative and Self-Direction
● Social and Cross-Cultural Skills
● Productivity and Accountability
● Leadership and Responsibility

Learning and Innovation Skills
● Creativity and Innovation
● Critical Thinking and Problem Solving
● Communication and Collaboration

Information, Media, and Technology Skills
● Information Literacy
● Media Literacy
● Information Communication Technology Literacy</td>
</tr>
<tr>
<td>Resources/ Materials</td>
<td colspan="2">● Discovery Education (https://www.discoveryeducation.com/)
● Scholastic Super Science Magazine (https://superscience.scholastic.com/)
● ReadWorks (https://www.readworks.org)
● PBS Learning Media (https://www.pbslearningmedia.org/)
● CK-12 (https://www.ck12.org/)
● BrainPop (https://www.brainpop.com/)
● CrashCourseKids (https://www.youtube.com/user/crashcoursekids)
● StudyJams! (https://studyjams.scholastic.com/studyjams/)
● Teacher Generated Materials
● Learning Stations
● Task Cards</td>
</tr>
</table>

<table>
<tr><th colspan="5">Instructional Unit Map</th></tr>
<tr><td colspan="5">Course Title: Science 6</td></tr>
<tr><td>Unit Title</td><td colspan="2">Matter and Energy in Organisms & Ecosystems</td><td>Start Date:
Length of Unit:</td><td>April
Approx. 25 days</td></tr>
<tr><td>Content Standards
What do we want them to know, understand, & do?</td><td colspan="2">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.</td><td>Learning Goals</td><td>Students will be able to:
Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.</td></tr>
<tr><td>Essential Questions</td><td colspan="4">How do changes in the availability of matter and energy affect populations in an ecosystem?
How do relationships among organisms in an ecosystem affect populations?</td></tr>
</table>

	● *How can you explain the stability of an ecosystem by tracing the flow of matter and energy?*		
Assessments *How will we know they have gained the knowledge & skills?*	**Formative**	**Summative**	**Alternative**
	● Choral and individual responses to questioning ● Entrance/Exit Tickets ● Quizzes (paper-based and/or Google forms) ● Signals (thumbs up/down, sit/stand, and other answering strategies) ● Graded Classwork/ Homework ● Plickers Assessments ● Kahoot games/reviews ● Individual white boards ● "Brain Dump" ● Observations & informal discussions with small groups or individuals during labs ● Silent classroom polls	● End of Unit Test ● Extended Constructed Response Questions ● Project ● Lab Analysis/Conclusion ● Demonstration with explanation & fielding questions	● Student-Taught Lesson (small groups of students will teach the class) ● BrainPop Video (students create their own BrainPop-style video to explain a science phenomena) ● Advice Column (students write advice to an "anonymous friend" to help solve a scientific problem) ● Trivia Game (students create the questions and answers to be used in a review game)

Unit Pre-Assessment(s) *What do they already know?*	● Pre-Test (paper-based, Google Form, Plickers, etc.) ● Teacher-generated warm up questions with class discussion ● Individual Whiteboards (students hold up agree/disagree or short answers in response to questions or statements) ● Blind-Polling with Thumbs Up/Down (teacher asks a question or provides a vocabulary word; students close their eyes and demonstrate their comfort level with the information by indicating a thumbs up or down) ● "Four Corners" (students are given a series of statements, decide for each one the level to which they agree/disagree, and then move to the appropriate area of the classroom identified with one of the options. Students will discuss their positions with the others in their group and present their opinions to the rest of the class) ● KWL Chart (Prior learning statement as per the NJDOE's model curriculum) *By the end of Grade 5, students understand that:* ● Populations live in a variety of habitats, and change in those habitats affects the organisms living there. ● Organisms can survive only in environments in which their particular needs are met. ● 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. ● Newly introduced species can damage the balance of an ecosystem. ● The food of almost any animal can be traced back to plants. ● Organisms are related in food webs, in which some animals eat plants for food and other animals eat the animals that eat plants; eventually, decomposers restore some materials to the soil. ● Matter cycles between the air and soil and among organisms as they live and die and among plants, animals, and microbes as these organisms live and die. ● Organisms obtain gases and water from the environment and release waste matter (gas, liquid, or solid) back into the environment. ● Adult plants and animals can have young. ● In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.
Instructional Strategies/	● Direct Instruction ● Scaffolding ● Guided Practice ● Cooperative learning

<table>
<tr><td>Student Activities</td><td colspan="4">

Modeling
Learning Stations
Graphic organizers
Note-taking sheets
Turn and Talk / Think-Pair-Share
Flexible grouping
Student Choice Menu Project
Inquiry-based learning
RAFT assignments
Self and Peer Review
Word/picture/object sorts
Read & Think Alouds

</td></tr>
<tr><td rowspan="2">Instructional/Assessment Scaffolds (Modifications /Accommodations) – planned for prior to instruction</td><td>English Language Learners</td><td>Special Education Learners</td><td>Struggling Learners</td><td>Advanced Learners</td></tr>
<tr><td>

Preferential seating on an as-needed basis
Buddy with a bilingual student (if able)
Provide key vocabulary with definitions in native language at the start of each unit
Provide leveled reading material
Use native language (for written directions)
Allow use of online translator during independent work time

</td><td>

Preferential seating on an as-needed basis
Read directions aloud
Highlight/underline key words
Additional time
Vary essay lengths
Chunk projects or long-term assignments
Read assessments aloud

</td><td>

Preferential seating on an as-needed basis
Read directions aloud
Clarifying directions or conducting check-ins as needed
Highlight/underline key words
Additional time
Concrete examples / examples related to personal interests or background
Use of mnemonics
Provide leveled reading material
Differentiated grouping
Use of visual representations of concepts
Flexible grouping

</td><td>

Learning stations
Independent study
Learning menus / Choice boards
Virtual escape rooms (unit specific)
Current event presentations
Creation of presentation, video or written review of a science topic or

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</table>

	● Read directions aloud ● Highlight/underline key words ● Simplify language ● Single step directions ● Modify format/length of tests ● Allow oral responses ● Additional time ● Allow retakes ● Chunk projects or long-term assignments ● Use of visual representations of concepts	● Modify format/ length of tests ● Allow oral responses ● Allow retakes ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Small group instruction ● Read test passages/articles aloud (if assessing reading comprehension) ● Provide study guides or copies of class notes	● Provide study guides or copies of class notes prior to tests ● Allow retakes ● Chunk projects or long-term assignments ● Collaborate with after-school programs or clubs to extend learning opportunities.	phenomena to be posted on our classroom website and shared with peers
Differentiated Instructional Methods: *(Multiple means for students to*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	● Interactive Notebook/Note-taking sheet (guided notes, “doodle” notes, Cornell notes, etc.) ● Learning Stations with varied standard-based tasks ● Use of Promethean Board for discussions, visuals, note-taking, interactives, etc. ● Multi-level electronic texts (with audio capability) provided through Google Classroom		● Student choice during formal assessment style (eliminate a certain number of questions, answer open-ended option A or B, draw a diagram or explain, etc.) ● Menu Project / Choice Board ● Individual or Small-group presentation ● Rubric/criteria for success generated by teacher and students (may be different for different individuals/groups)	

access content and multiple modes for student to express understanding)	● Read & Think Alouds ● Flexible grouping ● Reteaching /Reviewing ● Targeting Different Senses Within the Lesson (verbal, video, hands-on, use of visuals, modeling/acting out, songs/chants, etc) ● Reflection & Goal-setting ● Free Study Time (student choice: reviewing of notes, completion of task cards, watching a video review, small-group game, work completion with teacher-	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier II - claim, evidence, reasoning, analyze, interpret, data, abundance, scarcity, competition, model, cycle, conservation, energy, probability, construct, data, observe, analyze, criteria, constraint, evaluate Tier III - resource availability, organism, population, ecosystem, reproduction, ecosystem, habitat, predator, prey, predation, species, population, population density, community, biotic, abiotic, carrying capacity, limiting factor, symbiotic, mutualism, commensalism, parasitism, herbivory, matter, generalist, producer, consumer, herbivore, carnivor, omnivore, scavenger, decomposer, food chain, food web	
Integration of Technology SAMR	Substitution: ● Taking notes via Google Docs ● Typing up responses to questioning and sharing with teacher/peer ● Completing graphic organizers via Google Docs or Slides ● Completing digital worksheets via Google Forms, Docs, or Slides ● Use of online-based texts with dictionary and highlighting features ● Conducting research via Google ● Use of Google Classroom for providing and organizing materials Augmentation: ● Completing quizzes/tests via Google Forms ● Researching within Google Docs to add information and graphics to enhance notes	

	● Use of online-based texts with embedded videos and links to enhance understanding ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of scientific diagrams/models using Google Drawings ● Sharing videos, simulations, and other "extras" via Google Classroom to supplement notes and understanding ● Posting student created material via Padlet for sharing with peers ● Use of Quizizz or Kahoot! to review before a test Modification: ● Collaboration of students on a multimedia/slides project ● Peer-editing multimedia work ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of presentation, video, or written review of a science topic or phenomena posted on our classroom website ● Student completion of WebQuests ● Student participation in Digital Escape Rooms ● Plickers assessments Redefinition: ● Collaboration of students on a multimedia/slides project ● Posting, reviewing, and commenting on student created material via Padlet ● Student-Created and Student-Taught Lesson with multimedia presentation ● Use of Quizizz or Kahoot! to review before a test ● Plickers assessments
Interdisciplinary Connections NJ Student Learning Standards	*English Language Arts/Literacy* ● Cite specific, empirical, textual evidence to support analysis of how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively. ● Trace and evaluate the argument and specific claims in a text about how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively. Distinguish claims that are supported by empirical evidence and scientific reasoning from claims that are not.

<table>
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- Write an argument focused on how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.

Mathematics

- Understand that a set of data collected to answer a statistical question about how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively, has a distribution which can be described by its center (mean), spread (range), and overall shape (shape of the distribution of data).
- Summarize numerical data sets, collected to answer a statistical question about how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively, that have a distribution that can be described by its center (mean), spread (range), and overall shape (shape of the distribution of data) in relation to their context.

</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td>

Global Awareness:

- Using 21st Century Skills to understand and address global issues

Environmental Literacy:

- Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems.
- Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.).
- Investigate and analyze environmental issues, and make accurate conclusions about effective solutions.

</td><td>

Life and Career Skills

- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

Learning and Innovation Skills

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

Information, Media, and Technology Skills

- Information Literacy
- Media Literacy
- Information Communication Technology Literacy

</td></tr>
</table>

	● Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).	
Resources/ Materials	● Gizmos Simulations (https://www.explorelearning.com/) - "Ecosystems" ● Discovery Education (https://www.discoveryeducation.com/) ● Scholastic Super Science Magazine (https://superscience.scholastic.com/) ● ReadWorks (https://www.readworks.org) ● PBS Learning Media (https://www.pbslearningmedia.org/) ● CK-12 (https://www.ck12.org/) ● "Whoooo Wants Leftovers" (https://betterlesson.com/lesson/631898/whoo-wants-leftovers) ● BrainPop (https://www.brainpop.com/) ● CrashCourseKids (https://www.youtube.com/user/crashcoursekids) ● StudyJams! (https://studyjams.scholastic.com/studyjams/) ● Teacher Generated Materials ● Learning Stations ● Task Cards ● "Energy Flow" Inquiry Lab	

Instructional Unit Map			
Course Title: Science 6			
Unit Title	Interdependent Relationships in Ecosystems	**Start Date:**	May
		Length of Unit:	Approx. 25 days

Content Standards *What do we want them to know, understand, & do?*	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. MS-ETS1-1 - Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-3 - Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined	**Learning Goals**	Students will be able to: ● Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. ● Evaluate competing design solutions for maintaining biodiversity and ecosystem services. ● Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. ● Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

	into a new solution to better meet the criteria for success.		
Essential Questions	● *How can a single change to an ecosystem disrupt the whole system?* ● *What can limit the number and variety of living things in an ecosystem?*		
Assessments *How will we know they have gained the knowledge & skills?*	**Formative**	**Summative**	**Alternative**
	● Choral and individual responses to questioning ● Entrance/Exit Tickets ● Quizzes (paper-based and/or Google forms) ● Signals (thumbs up/down, sit/stand, and other answering strategies) ● Graded Classwork/ Homework ● Plickers Assessments ● Kahoot games/reviews ● Individual white boards ● "Brain Dump" ● Observations & informal discussions with small groups or individuals during labs ● Silent classroom polls	● End of Unit Test ● Extended Constructed Response Questions ● Project ● Lab Analysis/Conclusion ● Demonstration with explanation & fielding questions	● Student-Taught Lesson (small groups of students will teach the class) ● BrainPop Video (students create their own BrainPop-style video to explain a science phenomena) ● Advice Column (students write advice to an "anonymous friend" to help solve a scientific problem) ● Trivia Game (students create the questions and answers to

			be used in a review game)
Unit Pre-Assessment(s) *What do they already know?*	● Pre-Test (paper-based, Google Form, Plickers, etc.) ● Teacher-generated warm up questions with class discussion ● Individual Whiteboards (students hold up agree/disagree or short answers in response to questions or statements) ● Blind-Polling with Thumbs Up/Down (teacher asks a question or provides a vocabulary word; students close their eyes and demonstrate their comfort level with the information by indicating a thumbs up or down) ● "Four Corners" (students are given a series of statements, decide for each one the level to which they agree/disagree, and then move to the appropriate area of the classroom identified with one of the options. Students will discuss their positions with the others in their group and present their opinions to the rest of the class) ● KWL Chart (Prior learning statement as per the NJDOE's model curriculum) *By the end of Grade 5, students understand that:* ● When the environment changes in ways that affect a place's physical characteristics, temperature, or available resources, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. ● Populations of organisms live in a variety of habitats. Changes in those habitats affect the organisms living there. ● Research on a problem should be carried out before work to design a solution begins. Testing a solution involves investigating how well it performs under a range of likely conditions. ● At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. ● Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. ● Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.		
Instructional Strategies/	● Direct Instruction ● Scaffolding ● Guided Practice		

<table>
<tr><td>Student Activities</td><td colspan="4">

Cooperative learning
Modeling
Learning Stations
Graphic organizers
Note-taking sheets
Turn and Talk / Think-Pair-Share
Flexible grouping
Student Choice Menu Project
Inquiry-based learning
RAFT assignments
Self and Peer Review
Word/picture/object sorts
Read & Think Alouds

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<tr><td rowspan="2">Instructional/Assessment Scaffolds (Modifications /Accommodations) – planned for prior to instruction</td><td>English Language Learners</td><td>Special Education Learners</td><td>Struggling Learners</td><td>Advanced Learners</td></tr>
<tr><td>

Preferential seating on an as-needed basis
Buddy with a bilingual student (if able)
Provide key vocabulary with definitions in native language at the start of each unit
Provide leveled reading material
Use native language (for written directions)

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Preferential seating on an as-needed basis
Read directions aloud
Highlight/underline key words
Additional time
Vary essay lengths
Chunk projects or long-term assignments
Read assessments aloud

</td><td>

Preferential seating on an as-needed basis
Read directions aloud
Clarifying directions or conducting check-ins as needed
Highlight/underline key words
Additional time
Concrete examples / examples related to personal interests or background
Use of mnemonics
Provide leveled reading material
Differentiated grouping
Use of visual representations of concepts

</td><td>

Learning stations
Independent study
Learning menus / Choice boards
Virtual escape rooms (unit specific)
Current event presentations
Creation of presentation, video or written review of a

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	● Allow use of online translator during independent work time ● Read directions aloud ● Highlight/underline key words ● Simplify language ● Single step directions ● Modify format/length of tests ● Allow oral responses ● Additional time ● Allow retakes ● Chunk projects or long-term assignments ● Use of visual representations of concepts	● Modify format/ length of tests ● Allow oral responses ● Allow retakes ● Provide leveled reading material ● Differentiated grouping ● Use of visual representations of concepts ● Small group instruction ● Read test passages/articles aloud (if assessing reading comprehension) ● Provide study guides or copies of class notes	● Flexible grouping ● Provide study guides or copies of class notes prior to tests ● Allow retakes ● Chunk projects or long-term assignments ● Collaborate with after-school programs or clubs to extend learning opportunities.	science topic or phenomena to be posted on our classroom website and shared with peers
Differentiated Instructional Methods: *(Multiple means for students to*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	● Interactive Notebook/Note-taking sheet (guided notes, “doodle” notes, Cornell notes, etc.) ● Learning Stations with varied standard-based tasks ● Use of Promethean Board for discussions, visuals, note-taking, interactives, etc. ● Multi-level electronic texts (with audio capability) provided through Google Classroom		● Student choice during formal assessment style (eliminate a certain number of questions, answer open-ended option A or B, draw a diagram or explain, etc.) ● Menu Project / Choice Board ● Individual or Small-group presentation ● Rubric/criteria for success generated by teacher and students (may be different for different individuals/groups)	

access content and multiple modes for student to express understanding)	● Read & Think Alouds ● Flexible grouping ● Reteaching /Reviewing ● Targeting Different Senses Within the Lesson (verbal, video, hands-on, use of visuals, modeling/acting out, songs/chants, etc) ● Reflection & Goal-setting ● Free Study Time (student choice: reviewing of notes, completion of task cards, watching a video review, small-group game, work completion with teacher-	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier II - claim, evidence, reasoning, analyze, design, solution, interpret, data, data, analyze, criteria, constraint, limitation, evaluate, characteristics, dynamic, pattern, infer, resource, modify, refine, optimal, variable Tier III - biodiversity, terrestrial, oceanic, ecosystem, ecosystem services, water purification, nutrient recycling, prevention of soil erosion, natural disaster, species, indicator/keystone species, food chain, food web	
Integration of Technology <u>SAMR</u>	Substitution: ● Taking notes via Google Docs ● Typing up responses to questioning and sharing with teacher/peer ● Completing graphic organizers via Google Docs or Slides ● Completing digital worksheets via Google Forms, Docs, or Slides ● Use of online-based texts with dictionary and highlighting features ● Conducting research via Google ● Use of Google Classroom for providing and organizing materials Augmentation: ● Completing quizzes/tests via Google Forms ● Researching within Google Docs to add information and graphics to enhance notes	

	● Use of online-based texts with embedded videos and links to enhance understanding ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of scientific diagrams/models using Google Drawings ● Sharing videos, simulations, and other "extras" via Google Classroom to supplement notes and understanding ● Posting student created material via Padlet for sharing with peers ● Use of Quizizz or Kahoot! to review before a test Modification: ● Collaboration of students on a multimedia/slides project ● Peer-editing multimedia work ● Using Gizmos, Phet, and other virtual labs/simulations ● Creation of presentation, video, or written review of a science topic or phenomena posted on our classroom website ● Student completion of WebQuests ● Student participation in Digital Escape Rooms ● Plickers assessments Redefinition: ● Collaboration of students on a multimedia/slides project ● Posting, reviewing, and commenting on student created material via Padlet ● Student-Created and Student-Taught Lesson with multimedia presentation ● Use of Quizizz or Kahoot! to review before a test ● Plickers assessments
Interdisciplinary Connections NJ Student Learning Standards	*English Language Arts/Literacy* ● Distinguish among facts, reasoned judgment based on research findings, and speculation when reading text about maintaining biodiversity and ecosystem services. Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. ● Trace and evaluate the argument and specific claims in a text *about maintaining biodiversity and ecosystem services*, distinguishing claims that are supported by reasons and evidence from claims that are not. Trace and evaluate the

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<tr><td></td><td colspan="2">arguments about specific claims in a text and assess whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.
● Include multimedia components and visual displays as part of an argument about competing design solutions based on jointly developed and agreed-upon design criteria to clarify information. Include multimedia components and visual displays. The multimedia component and visual displays should clarify claims and findings and emphasize salient points in the presentation.

Mathematics

● Model design solutions for maintaining biodiversity and ecosystem services with mathematics. Use ratio and rate reasoning to evaluate competing design solutions for maintaining biodiversity and ecosystem services.
● Develop a model that generates data for the iterative testing of competing design solutions involving a proposed object, tool, or process that maintains biodiversity and ecosystem services, reasoning quantitatively (with amounts, numbers, sizes) and abstractly (with variables).
● Develop a probability and use it to find the probability that designed systems, including those representing inputs and outputs, will maintain biodiversity and ecosystem services. Compare probabilities from the model to observe frequencies. If the agreement is not good, explain possible sources of the discrepancy.</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td><u>Global Awareness:</u>
● Using 21st Century Skills to understand and address global issues

<u>Environmental Literacy:</u>
● Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems.

● Demonstrate knowledge and understanding of society’s impact on the natural world (e.g.,</td><td>Life and Career Skills
● Flexibility and Adaptability
● Initiative and Self-Direction
● Social and Cross-Cultural Skills
● Productivity and Accountability
● Leadership and Responsibility

Learning and Innovation Skills
● Creativity and Innovation
● Critical Thinking and Problem Solving
● Communication and Collaboration</td></tr>
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	population growth, population development, resource consumption rate, etc.). ● Investigate and analyze environmental issues, and make accurate conclusions about effective solutions. ● Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).	Information, Media, and Technology Skills ● Information Literacy ● Media Literacy ● Information Communication Technology Literacy
Resources/ Materials	● Discovery Education (https://www.discoveryeducation.com/) ● Scholastic Super Science Magazine (https://superscience.scholastic.com/) ● ReadWorks (https://www.readworks.org) ● PBS Learning Media (https://www.pbslearningmedia.org/) ● CK-12 (https://www.ck12.org/) ● Investigating Invasive Species: Project Based Learning Task ● BrainPop (https://www.brainpop.com/) ● CrashCourseKids (https://www.youtube.com/user/crashcoursekids) ● StudyJams! (https://studyjams.scholastic.com/studyjams/) ● Teacher Generated Materials ● Learning Stations ● Task Cards ● “Human Impact on Oceans” Inquiry Lab ● “Designs for Biodiversity” Inquiry Lab	