

Essex Fells Public School

CURRICULUM & INSTRUCTION

Science

Grade: 6

ABSTRACT

Students are expected to demonstrate grade appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding in the disciplines of physical, life and Earth and space sciences. Student performance will be evaluated using a variety of assessments, including teacher-generated tests and quizzes, laboratory activities, homework, research projects, class participation and small group exploration activities.

BOE Approved: 8/12/26

ESSEX FELLS PUBLIC SCHOOLS

Grade 6 Science

Unit of Study: <i>(Pacing Guide - Specify time frame by days or weeks)</i>	Space Systems September-October <i>(8 weeks)</i>	Weather and Climate November - January <i>(12 weeks)</i>	Structure, Function and Information Processing February - March <i>(8 weeks)</i>
STAGE 1: Desired Results			
Established Goals: Write out complete NJSLS: <i>(Content Specific Standards Only. Only use standards that are applicable to the unit.)</i>	MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. MS-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system.	MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions. MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused climate change over the past century. MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. MS-LS1-3 Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. MS-LS1-8 Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Interdisciplinary Connections: Write out complete NJSLS: <i>(Must have at least one standard from one of these areas but may have more):</i> • <i>ELA companion standards;</i> • <i>Standards for Mathematical; Practice</i> • <i>Science;</i> • <i>Visual/Performing Arts) - Standard 1;</i> • <i>Comprehensive Health & PE - Standard 2;</i> • <i>Social Studies - Standard 6;</i> • <i>World Languages - Standard 7;</i>	ELA RST.6-8.7: Integrate quantitative or technical information expressed in words with information displayed visually (diagrams, models, graphs, tables). RST.6-8.3: Follow precisely a multistep procedure when carrying out investigations. Math 6.SP.B.5: Summarize numerical data sets in relation to their context. MP.4: Model with mathematics. Social Studies 6.1.8.GeoSV.2.a: Use geographic tools and spatial thinking to analyze relationships between people and Earth's systems.	ELA RST.6-8.8: Distinguish among facts, reasoned judgment, and speculation in scientific texts. RST.6-8.9: Compare information from experiments, simulations, videos, and texts. WHST.6-8.1: Write arguments supported by evidence. Social Studies 6.1.8.GeoHE.1.a: Analyze how physical processes influence human activity and settlement patterns. Health/PE 2.2.8.LF.5: Analyze how environmental conditions influence personal and community health.	ELA RST.6-8.3: Follow multistep procedures during investigations. WHST.6-8.2: Write informative/explanatory texts using scientific evidence. WHST.6-8.1: Write arguments supported by evidence. RST.6-8.8: Distinguish among facts, evidence, and speculation. Math MP.5: Use appropriate tools strategically. 6.RP.A.3: Use ratios to describe relationships among quantities. Social Studies 6.1.8.HistoryCC.4.a: Explain how scientific discoveries and technological innovations have influenced society.
Integration of Career Readiness, Life Literacies & Key Skills: Write out complete NJSLS: <i>(Must have at least one standard from:</i> • <i>9.1 Personal Financial Literacy; or</i> • <i>9.2 Career Awareness, Exploration, Preparation & Training; or</i> • <i>9.4 Life Literacies & Key Skills)</i>	Life Literacies & Key Skills 9.4.8.CT.2: Develop multiple solutions to solve a problem and evaluate them based on constraints and criteria. 9.4.8.IML.5: Analyze information from multiple sources to evaluate its credibility and accuracy. 9.4.8.CT.1: Evaluate diverse solutions based on data, evidence, and established criteria.	Life Literacies & Key Skills 9.4.8.IML.5: Analyze information from multiple sources to evaluate credibility and accuracy. 9.4.8.CT.2: Develop and evaluate solutions using data, evidence, and constraints. 9.4.8.IML.4: Ask informed questions and evaluate the quality of information to solve problems and make decisions.	Life Literacies & Key Skills 9.4.8.IML.5: Evaluate the credibility and accuracy of information from multiple sources. 9.4.8.CT.2: Develop and evaluate multiple solutions to scientific problems using evidence. 9.4.8.IML.4: Ask informed questions and evaluate evidence to solve problems and make decisions. 9.4.8.CT.1: Evaluate solutions based on evidence, criteria, and constraints.

Integration of Computer Science and Design Thinking: Write out complete NJSLS: <i>(Must have at least one standard from:</i> • 8.1 Computer Science; or • 8.2 Design Thinking)	Computer Science 8.1.8.DA.1: Organize and transform data using computational tools to make it more useful for analysis and visualization. 8.1.8.DA.2: Collect, organize, and analyze data using digital tools to identify patterns and relationships. 8.1.8.DA.3: Use data analysis tools to identify trends, patterns, and relationships to support conclusions.	Computer Science 8.1.8.DA.2: Collect, organize, and analyze data using digital tools to identify patterns and relationships. 8.1.8.DA.3: Use data visualization tools to analyze trends and communicate findings. 8.1.8.IC.1: Evaluate the reliability and bias of digital information sources. 8.1.8.DA.2: Analyze datasets to identify trends.	Computer Science 8.1.8.DA.2: Collect, organize, and analyze scientific data using digital tools. 8.1.8.DA.3: Use models and visualizations to communicate scientific information. 8.1.8.IC.1: Evaluate the reliability and bias of digital information sources. 8.1.8.DA.1: Organize and present data using digital tools to explain scientific concepts.
21st Century Life and Careers: Career Education: Write out complete NJSLS: <i>(Only include if a CTE curriculum</i> • 9.3 Career and Technical Education)	N/A	N/A	N/A
Enduring Understandings: <i>(Follow UbD: What big ideas will students know?)</i>	• Generate and analyze evidence to explain why the Sun’s apparent motion across the sky changes over the course of the 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	• Develop a conceptual model to explain the mechanisms for the Sun’s energy to drive wind and the hydrologic cycle. • 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	• All living organisms are made of cells, which are the basic units of structure and function. • The structures within cells work together to carry out the processes necessary for life. • Cells are organized into tissues, organs, and organ systems that interact to maintain the health and survival of an organism. • The human body functions as an interconnected system in which each subsystem depends on others to perform essential life processes. • Living organisms detect and respond to changes in their environment through specialized

	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.	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. - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	sensory receptors and coordinated nervous system responses. - Models, investigations, and scientific evidence help explain how cells and body systems function together to sustain life. - The organization of living systems demonstrates that structure and function are closely related at every level, from cells to entire organisms. - Scientific knowledge about cells, body systems, and information processing helps improve medicine, health care, and quality of life. - Evidence-based reasoning and scientific investigations deepen our understanding of how living organisms grow, survive, and adapt to their environments. - Advances in biology and technology continue to expand our understanding of cells, body systems, and human health.
Essential Questions: (Follow UbD best practices in the creation of questions)	- Why does the Sun's position change over time? - What causes the Sun's position to change during the year? - How does the position of the Earth and Sun affect seasonal patterns? - What causes the phases of the moon? - What causes solar and lunar eclipses? - What determines the gravitational pull on an object?	- What is the difference between weather and climate? - What is the sun's role in the water cycle and how does that affect us? - How does energy from the Sun affect wind on Earth? - What is air? - What is the atmosphere? - How does pressure affect air? - What happens when two areas of air have different pressures? - What factors do meteorologists	- What are the building blocks of life? - How does each part of a cell function? - How is the body a system of interacting subsystems composed of groups of cells? - What are the fundamental differences between animal and plant cells pertaining to cell reproduction? - How do our sensory receptors

	- How does gravity hold planets in orbit? How do objects in our solar system compare? - How do scientists study our solar system?	- use to forecast the weather? - Why can't meteorologists predict weather with 100% certainty? - What is density? - What affects the direction that ocean water flows? - How does the weather differ between locations? - How does the ocean affect climate on land? - How does energy from the Sun affect weather and climate on Earth? - How does latitude affect an area's weather and climate? - How has the climate changed over time? - How do greenhouse gases in the atmosphere affect Earth's temperature? - What can we do to prevent the continuation of global warming?	send information to our brain?
STAGE 2: Evidence			
Assessment & Evidence: <i>(By what criteria will performances of understanding be judged? Include:</i> 1. <i>Formative,</i> 2. <i>Summative,</i> 3. <i>Alternative - Performance/Project)</i> 4. <i>Benchmark)</i>	Formative Assessments - Exit tickets - Science journal entries - Classroom discussions and questioning - Think-Pair-Share activities - Teacher observations during investigations and engineering challenges - Graphic organizers and concept maps	Formative Assessments - Exit tickets - Science journal entries - Classroom discussions and questioning - Think-Pair-Share activities - Teacher observations during investigations and engineering challenges - Graphic organizers and concept maps - Interactive notebook reflections	Formative Assessments - Exit tickets - Science journal entries - Classroom discussions and questioning - Think-Pair-Share activities - Teacher observations during investigations and engineering challenges - Graphic organizers and concept maps - Interactive notebook reflections

	● Interactive notebook reflections ● Quick writes explaining scientific concepts ● Model or diagram checks ● Peer assessments ● Self-assessments Summative Assessments ● Unit test (multiple choice, short answer, and constructed response) ● Performance task demonstrating understanding of Earth's systems ● Engineering design challenge with written explanation ● Research project on environmental conservation ● Scientific model with written justification ● Oral or multimedia presentation explaining scientific evidence ● End-of-unit project Alternative Assessments ● Build and present a 3D model ● Digital slideshow or infographic ● Video explaining an engineering solution ● STEM design portfolio ● Environmental awareness poster or public service announcement (PSA) ● Oral presentation or student conference ● Interactive digital notebook ● Classroom demonstration or simulation	● Quick writes explaining scientific concepts ● Model or diagram checks ● Peer assessments ● Self-assessments Summative Assessments ● Unit test (multiple choice, short answer, and constructed response) ● Performance task demonstrating understanding of Earth's systems ● Engineering design challenge with written explanation ● Research project on environmental conservation ● Scientific model with written justification ● Oral or multimedia presentation explaining scientific evidence ● End-of-unit project Alternative Assessments ● Build and present a 3D model ● Digital slideshow or infographic ● Video explaining an engineering solution ● STEM design portfolio ● Environmental awareness poster or public service announcement (PSA) ● Oral presentation or student conference ● Interactive digital notebook ● Classroom demonstration or simulation	● Quick writes explaining scientific concepts ● Model or diagram checks ● Peer assessments ● Self-assessments Summative Assessments ● Unit test (multiple choice, short answer, and constructed response) ● Performance task demonstrating understanding of Earth's systems ● Engineering design challenge with written explanation ● Research project on environmental conservation ● Scientific model with written justification ● Oral or multimedia presentation explaining scientific evidence ● End-of-unit project Alternative Assessments ● Build and present a 3D model ● Digital slideshow or infographic ● Video explaining an engineering solution ● STEM design portfolio ● Environmental awareness poster or public service announcement (PSA) ● Oral presentation or student conference ● Interactive digital notebook ● Classroom demonstration or simulation
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	- Choice board project Benchmark Assessments - District or grade-level common science assessment - NGSS-style performance assessment - Quarterly benchmark assessment - Standards-based assessment aligned to NGSS - Data analysis task using graphs and scientific evidence - Engineering design performance task with rubric - End-of-unit cumulative assessment - Science portfolio review	- Choice board project Benchmark Assessments - District or grade-level common science assessment - NGSS-style performance assessment - Quarterly benchmark assessment - Standards-based assessment aligned to NGSS - Data analysis task using graphs and scientific evidence - Engineering design performance task with rubric - End-of-unit cumulative assessment - Science portfolio review	- Choice board project Benchmark Assessments - District or grade-level common science assessment - NGSS-style performance assessment - Quarterly benchmark assessment - Standards-based assessment aligned to NGSS - Data analysis task using graphs and scientific evidence - Engineering design performance task with rubric - End-of-unit cumulative assessment - Science portfolio review
STAGE 3: Learning Plan			
Learning Activities/Content: <i>(What is the core content of this unit? What performance tasks/ activities will students do? What skills will students know? Include content that adheres to NJ Administrative Code and Statutes:</i> - Amistad Law - Holocaust Law - LGBTQ/Disabilities Law)	DEI - Diversity and Inclusion Law (N.J.S.A. 18A:35-4.36a) 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions. Amistad 6.1.5.CivicsDP.2: Compare and contrast responses of individuals and groups, past and present, to violations of fundamental rights (e.g., fairness, civil rights, human rights).	DEI - Diversity and Inclusion Law (N.J.S.A. 18A:35-4.36a) 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions. Amistad 6.1.5.CivicsDP.2: Compare and contrast responses of individuals and groups, past and present, to violations of fundamental rights (e.g., fairness, civil rights, human rights).	DEI - Diversity and Inclusion Law (N.J.S.A. 18A:35-4.36a) 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions. Amistad 6.1.5.CivicsDP.2: Compare and contrast responses of individuals and groups, past and present, to violations of fundamental rights (e.g., fairness, civil rights, human rights).

	Diversity and Inclusion ● 2.1.5.EH.3: Identify different feelings and emotions that people may experience and how they might express these emotions (e.g., anger, fear, happiness, sadness, hopelessness, anxiety). ● 2.1.5.SSH.3: Demonstrate ways to promote dignity and respect for all people (e.g. sexual orientation, gender identity and expression, race, ethnicity, socio-economic status, differing ability, immigration status, family configuration). Holocaust Law ● 6.2.2.D.2 Recognize real people and fictional characters who have demonstrated responsible leadership and citizenship and identify the characteristics that have made them good examples. ● Students will use models to predict the lunar phase given the positions of Earth, Moon, and the Sun. ● Students will manipulate their models to show locations where a solar or lunar eclipse will take place. ● Students will trace their shadows in the morning and afternoon, and compare the tracings. ● They will use this information to determine the position of the Sun as it appears to move	Diversity and Inclusion ● 2.1.5.EH.3: Identify different feelings and emotions that people may experience and how they might express these emotions (e.g., anger, fear, happiness, sadness, hopelessness, anxiety). ● 2.1.5.SSH.3: Demonstrate ways to promote dignity and respect for all people (e.g. sexual orientation, gender identity and expression, race, ethnicity, socio-economic status, differing ability, immigration status, family configuration). Holocaust Law ● 6.2.2.D.2 Recognize real people and fictional characters who have demonstrated responsible leadership and citizenship and identify the characteristics that have made them good examples. ● Analyze data to determine the relationship of humans and the earth's natural resources. ● Compare and explain amounts and percentages of water in various parts of the earth ● Create a model illustrating distribution of Earth's water. ● Environmental Concerns Project/presentation	Diversity and Inclusion ● 2.1.5.EH.3: Identify different feelings and emotions that people may experience and how they might express these emotions (e.g., anger, fear, happiness, sadness, hopelessness, anxiety). ● 2.1.5.SSH.3: Demonstrate ways to promote dignity and respect for all people (e.g. sexual orientation, gender identity and expression, race, ethnicity, socio-economic status, differing ability, immigration status, family configuration). Holocaust Law ● 6.2.2.D.2 Recognize real people and fictional characters who have demonstrated responsible leadership and citizenship and identify the characteristics that have made them good examples. ● Students investigate cells using a compound microscope ● Students use microscopes to explore unicellular and multicellular organisms, and plant and animal cells. ● Students use interactive website to explore the components within a cell and how they work together ● Develop a model in which
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	throughout the day. Students will use a light and moon model to determine the phases of the moon, and make a phases of the moon chart to summarize their results. ● Winter Olympics Project - Students will use their knowledge relating to seasons, earth's tilt, and solar energy to determine which location would be the best option for the 2026 Winter Olympics. ● Students will use a model to describe that gravity is an inward pulling force that can keep smaller/less massive objects in orbit around larger/more massive objects. ● Given different scenarios, students will determine which scenario would have the greatest gravitational pull. ● Students will calculate how much they would weigh on other planets and how far they could jump on other planets. They will use this data to come to a conclusion about gravitational pull and mass. ● Students will design a model or diagram that shows two ways gravitational pull exists between Earth and the Moon. ● Students will organize data on solar system objects to design diagrams, graphs, or physical models.	● Develop a supported claim utilizing information gathered through investigations. ● Investigate how water droplets form ● Observe how water shortages affect different parts of the world ● Incorporate examples of environmental stewardship from cultures around the world, including Indigenous knowledge and local community practices. ● Highlight scientists, engineers, and environmental leaders from diverse backgrounds. ● Use heterogeneous cooperative learning groups with clearly defined roles to ensure every student participates. ● Provide multiple ways for students to demonstrate understanding (models, drawings, oral presentations, digital media, or written responses). ● Connect learning to students' own communities by exploring local environmental issues and encouraging civic responsibility. ● Use Universal Design for Learning (UDL) strategies and accessible materials so all learners can actively engage in investigations and engineering challenges. ● Students investigate weather and climate in different regions of the	they identify the parts (components: nucleus, chloroplast, cell wall, mitochondria, cell membrane, the function of a cell as a whole) of cells ● Project: "A cell is like a _____" Students create a poster/model to display their analogy relating each organelle to something in their project (ex.city, park, school, etc) ● Students describe the relationships between the parts of cells in terms of their contributions to overall cellular function and the structure of the cell membrane or cell wall and its relationship to the function of the organelles and the whole cell. ● Students use the model to identify key differences between plant and animal cells based on structure and function. ● Build models of both a plant and animal cell and be able to demonstrate key characteristics that define both ● Students use interactive website to "Build an organ" using different tissues ● Lab: "Dissecting a Chicken Wing"- Students will dissect
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	• Students will use quantitative analyses to describe similarities and differences among solar system objects by describing patterns of features. • Students will identify advances in solar system science made possible by improved engineering. • Students will interpret quantitative and qualitative data to draw their own conclusions about patterns in the solar system (ex.: outer planets have the greatest size). • Encourage students to connect scientific concepts to their own cultures, experiences, and observations of the natural world. • Students investigate contributions of diverse scientists such as Katherine Johnson, Dr. Mae Jemison, Kalpana Chawla, Ellen Ochoa, Neil deGrasse Tyson, George Washington Carver (astronomy interests), Wang Zhenyi, and Indigenous astronomers. Create a classroom "Wall of Space Scientists."	world, including tropical, arid, polar, temperate, and mountainous climates. They compare how geography influences daily life, clothing, housing, agriculture, and traditions. • Students research how climate change and severe weather disproportionately affect different communities, particularly low-income communities, Indigenous populations, coastal regions, and island nations. Discuss equitable access to resources before, during, and after natural disasters. • Explore how Indigenous communities have historically used observations of weather, seasonal changes, plants, animals, and the sky to predict environmental changes. Compare traditional ecological knowledge with modern meteorology.	a chicken wing to observe the different types of tissues present in a wing • Project: Body Systems- Each group will research an assigned body system in order to create an informative poster about the body system and its function and display it on poster. Each group will then use what they've learned to determine how body systems interact with each other. • Lab: "Can You Trust Your Senses?"- Students will explore three of your sensory receptors: chemoreceptors (taste and smell) and photoreceptors (sight) • Lab: Response Time: Students will conduct an experiment to test visual, auditory, and tactile reaction times using one ruler. • Online Interactive: Students explore the process of synapse and how the brain receives and transmits messages. • Examine historical and modern examples of ethical issues in medical research, such as informed consent and equitable access to healthcare. Discuss how ethical standards protect participants and support
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			scientific progress. Students research how access to healthcare, nutrition, clean water, vaccinations, and medical technology influences health outcomes in different communities around the world. Focus on evidence-based public health practices rather than personal characteristics.
Resources: <i>(Include names of texts and all online resources)</i>	Textbook www.NSTA.org www.nextgenscience.org BrainPop Generation Genius Freckle EdPuzzle www.IXL.com www.ck12.org www.openscienced.org	Textbook www.NSTA.org www.nextgenscience.org BrainPop Generation Genius Freckle EdPuzzle www.IXL.com www.ck12.org www.openscienced.org	Textbook www.NSTA.org www.nextgenscience.org BrainPop Generation Genius Freckle EdPuzzle www.IXL.com www.ck12.org www.openscienced.org
Differentiation: <i>(What type of differentiated instruction will be used for each of the following subgroups:</i> 1. <i>Special Education</i> 2. <i>English Language Learners (ELLs)</i> 3. <i>At Risk/BSI</i> 4. <i>Gifted & Talented/Advanced</i> 5. <i>504</i>	Special Education - Extended time for task completion (Assignments, Assessments, etc..) - Provide copy of accurate notes - Breaking down and chunking assignments - Restating and clarifying instruction - Extra book provided to keep at home - Organizational assistance (notebook, assignment pad, lab materials, etc.) - Option to type instead handwriting notes - Adjusting class schedule to	Special Education - Extended time for task completion (Assignments, Assessments, etc..) - Provide copy of accurate notes - Breaking down and chunking assignments - Restating and clarifying instruction - Extra book provided to keep at home - Organizational assistance (notebook, assignment pad, lab materials, etc.) - Option to type instead	Special Education - Extended time for task completion (Assignments, Assessments, etc..) - Provide copy of accurate notes - Breaking down and chunking assignments - Restating and clarifying instruction - Extra book provided to keep at home - Organizational assistance (notebook, assignment pad, lab materials, etc.) - Option to type instead

	alternate instruction (morning/afternoon) • Modify test and quizzes • Provide manipulative examples • Preferential Seating • Use of Graphic Organizers (charts, visual outlines, etc..) • Repetition and clarification of directions Assessments and class work read aloud • Provide checklists • Movement breaks • Visual representation of print version • Use of an alarm/timer to aide with time management, including transitional warning • Nonverbal cue for off-task behavior • Provide positive reinforcement • Hands on learning activities • Ask student to restate directions or concepts taught • Deliver directions one step at a time, gradually increasing the number of steps delivered • Explain the purpose of the assignment to the student • Provide managed choices to increase on task behavior • Allow for break passes when needed English Language Learners (ELLs) • Provide alternate ways for the student to respond (verbal/pictographic answers instead of written) • Substitute a hands-on activity or use	handwriting notes • Adjusting class schedule to alternate instruction (morning/afternoon) • Modify test and quizzes • Provide manipulative examples • Preferential Seating • Use of Graphic Organizers (charts, visual outlines, etc..) • Repetition and clarification of directions Assessments and class work read aloud • Provide checklists • Movement breaks • Visual representation of print version • Use of an alarm/timer to aide with time management, including transitional warning • Nonverbal cue for off-task behavior • Provide positive reinforcement • Hands on learning activities • Ask student to restate directions or concepts taught • Deliver directions one step at a time, gradually increasing the number of steps delivered • Explain the purpose of the assignment to the student • Provide managed choices to increase on task behavior • Allow for break passes when needed English Language Learners (ELLs) • Provide alternate ways for the student to respond	handwriting notes • Adjusting class schedule to alternate instruction (morning/afternoon) • Modify test and quizzes • Provide manipulative examples • Preferential Seating • Use of Graphic Organizers (charts, visual outlines, etc..) • Repetition and clarification of directions Assessments and class work read aloud • Provide checklists • Movement breaks • Visual representation of print version • Use of an alarm/timer to aide with time management, including transitional warning • Nonverbal cue for off-task behavior • Provide positive reinforcement • Hands on learning activities • Ask student to restate directions or concepts taught • Deliver directions one step at a time, gradually increasing the number of steps delivered • Explain the purpose of the assignment to the student • Provide managed choices to increase on task behavior • Allow for break passes when needed English Language Learners (ELLs) • Provide alternate ways for the student to respond
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	of different media in projects for a written activity ● Provide word banks / word walls ● Prepare and distribute advance notes ● Provide model sentence frames and sentence starters for both oral responses and written responses ● Provide additional time to complete assessments and assignments ● Model and use gestures to aid in understanding ● Model tasks by giving one or two examples before releasing students to work independently ● Present instructions both verbally and visually ● Simplify written and verbal instructions Students At-Risk (BSI) ● Extended time for task completion (Assignments, Assessments, etc..) ● Provide copy of accurate notes ● Breaking down and chunking assignments ● Restating and clarifying instruction ● Extra book provided to keep at home ● Organizational assistance (notebook, assignment pad, lab materials, etc.) Gifted and Talented (Advanced) Students: ● Encourage independent studies or investigations ● Encourage creative expression by	(verbal/pictographic answers instead of written) ● Substitute a hands-on activity or use of different media in projects for a written activity ● Provide word banks / word walls ● Prepare and distribute advance notes ● Provide model sentence frames and sentence starters for both oral responses and written responses ● Provide additional time to complete assessments and assignments ● Model and use gestures to aid in understanding ● Model tasks by giving one or two examples before releasing students to work independently ● Present instructions both verbally and visually ● Simplify written and verbal instructions Students At-Risk (BSI) ● Extended time for task completion (Assignments, Assessments, etc..) ● Provide copy of accurate notes ● Breaking down and chunking assignments ● Restating and clarifying instruction ● Extra book provided to keep at home ● Organizational assistance (notebook, assignment pad, lab materials, etc.)	(verbal/pictographic answers instead of written) ● Substitute a hands-on activity or use of different media in projects for a written activity ● Provide word banks / word walls ● Prepare and distribute advance notes ● Provide model sentence frames and sentence starters for both oral responses and written responses ● Provide additional time to complete assessments and assignments ● Model and use gestures to aid in understanding ● Model tasks by giving one or two examples before releasing students to work independently ● Present instructions both verbally and visually ● Simplify written and verbal instructions Students At-Risk (BSI) ● Extended time for task completion (Assignments, Assessments, etc..) ● Provide copy of accurate notes ● Breaking down and chunking assignments ● Restating and clarifying instruction ● Extra book provided to keep at home ● Organizational assistance (notebook, assignment pad, lab materials, etc.)
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	allowing students to choose how to explore a problem ● Invite students to explore points of view ● Varied levels of reading text ● Enriched hands on center that students can explore independently ● Higher order thinking tasks and questions ● Provide leadership opportunities in lab groups ● Allow opportunities to analyze and evaluate materials 504 Plans ● Restating and clarifying instruction ● Extra book provided to keep at home ● Organizational assistance (notebook, assignment pad, lab materials, etc.) ● Option to type instead handwriting notes ● Adjusting class schedule to alternate instruction (morning/afternoon) ● Modify test and quizzes ● Provide manipulative examples ● Preferential Seating	Gifted and Talented (Advanced) Students: ● Encourage independent studies or investigations ● Encourage creative expression by allowing students to choose how to explore a problem ● Invite students to explore points of view ● Varied levels of reading text ● Enriched hands on center that students can explore independently ● Higher order thinking tasks and questions ● Provide leadership opportunities in lab groups 504 Plans ● Restating and clarifying instruction ● Extra book provided to keep at home ● Organizational assistance (notebook, assignment pad, lab materials, etc.) ● Option to type instead handwriting notes ● Adjusting class schedule to alternate instruction (morning/afternoon) ● Modify test and quizzes ● Provide manipulative examples ● Preferential Seating	Gifted and Talented (Advanced) Students: ● Encourage independent studies or investigations ● Encourage creative expression by allowing students to choose how to explore a problem ● Invite students to explore points of view ● Varied levels of reading text ● Enriched hands on center that students can explore independently ● Higher order thinking tasks and questions ● Provide leadership opportunities in lab groups 504 Plans ● Restating and clarifying instruction ● Extra book provided to keep at home ● Organizational assistance (notebook, assignment pad, lab materials, etc.) ● Option to type instead handwriting notes ● Adjusting class schedule to alternate instruction (morning/afternoon) ● Modify test and quizzes ● Provide manipulative examples ● Preferential Seating
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Unit of Study: <i>(Pacing Guide - Specify time frame by days or weeks)</i>	Topic: Growth, Development and Reproduction of Organisms April - June <i>(12 weeks)</i>
STAGE 1: Desired Results	
Established Goals: Write out complete NJSLS: <i>(Content Specific Standards Only. Only use standards that are applicable to the unit.)</i>	MS-LS1-4 Use arguments 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. MS-LS3-1 Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. MS-LS3-2 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. MS-LS4-5 Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.

Interdisciplinary Connections: Write out complete NJSLs: <i>(Must have at least one standard from one of these areas but may have more):</i> • <i>ELA companion standards;</i> • <i>Standards for Mathematical Practice</i> • <i>Science;</i> • <i>Visual/Performing Arts) - Standard 1;</i> • <i>Comprehensive Health & PE - Standard 2;</i> • <i>Social Studies - Standard 6;</i> • <i>World Languages - Standard 7;</i>	ELA RST.6-8.2: Determine central ideas and summarize scientific texts. WHST.6-8.1: Write arguments supported by scientific evidence. RST.6-8.1: Cite textual evidence to support scientific analysis. Math 6.SP.B.5: Summarize and interpret numerical data. MP.3: Construct viable arguments and critique the reasoning of others. Social Studies 6.1.8.GeoHE.1.a: Explain how environmental conditions affect organisms and communities.
Integration of Career Readiness, Life Literacies & Key Skills: Write out complete NJSLs: <i>(Must have at least one standard from:</i> • <i>9.1 Personal Financial Literacy; or</i> • <i>9.2 Career Awareness, Exploration, Preparation & Training; or</i> • <i>9.4 Life Literacies & Key Skills)</i>	Life Literacies 9.4.8.CT.1: Evaluate solutions using evidence, criteria, and constraints. 9.4.8.IML.5: Evaluate information from multiple credible sources. 9.4.8.IML.4: Ask informed questions and evaluate evidence to solve problems. 9.4.8.CT.2: Develop and evaluate multiple solutions using evidence. 9.4.8.IML.5: Analyze information from multiple sources to make informed decisions.

Integration of Computer Science and Design Thinking: Write out complete NJSLs: <i>(Must have at least one standard from:</i> • 8.1 Computer Science; - or • 8.2 Design Thinking)	Computer Science 8.1.8.DA.2: Collect, organize, and analyze scientific data using digital tools. 8.1.8.DA.3: Use digital tools to analyze and communicate scientific findings. 8.1.8.IC.1: Evaluate the reliability and bias of digital scientific information. 8.1.8.DA.1: Organize and visualize data using digital tools. 8.1.8.IC.3: Evaluate the ethical impacts of computing technologies and innovations on society.
21st Century Life and Careers: Career Education: Write out complete NJSLs: <i>(Only include if a CTE curriculum</i> • 9.3 Career and Technical Education)	N/A
Enduring Understandings: <i>(Follow UbD: What big ideas will students know?)</i>	• Organisms possess structures and behaviors that increase their chances of surviving and reproducing in their environments. • Both inherited genetic information and environmental conditions influence how organisms grow, develop, and function. • Genes carry the instructions for making proteins, and changes in genes can have beneficial, harmful, or neutral effects on an organism. • Sexual reproduction increases genetic variation among offspring, while asexual reproduction produces

	genetically identical offspring. • Genetic variation contributes to the diversity of life and provides populations with the ability to adapt over time. • Scientific models, investigations, and evidence help explain how traits are inherited and how organisms reproduce and develop. • Advances in genetics and biotechnology have transformed agriculture, medicine, and many other fields, while raising important ethical and societal questions. • Technology enables scientists to study, modify, and influence inherited traits, requiring responsible decision-making based on scientific evidence and ethical considerations. • Scientific explanations are strengthened through research, evidence, critical thinking, and the evaluation of multiple sources of information.
Essential Questions: <i>(Follow UbD best practices in the creation of questions)</i>	1. How do organisms reproduce? 2. What is the difference between sexual and asexual reproduction? 3. How can an organism's behavior increase its chance of survival and reproduction? 4. What structures or mechanisms aid in plant reproduction? 5. How does the environment contribute to successful reproduction or growth? 6. How do genetic factors influence the growth of organisms?

	7. How do natural differences in organisms increase survival and reproduction?
STAGE 2: Evidence	
Assessment & Evidence: <i>(By what criteria will performances of understanding be judged? Include:</i> 1. <i>Formative,</i> 2. <i>Summative,</i> 3. <i>Alternative - Performance/Project)</i> 4. <i>Benchmark)</i>	Formative Assessments ● Exit tickets ● Science journal entries ● Classroom discussions and questioning ● Think-Pair-Share activities ● Teacher observations during investigations and engineering challenges ● Graphic organizers and concept maps ● Interactive notebook reflections ● Quick writes explaining scientific concepts ● Model or diagram checks ● Peer assessments ● Self-assessments Summative Assessments ● Unit test (multiple choice, short answer, and constructed response) ● Performance task demonstrating understanding of Earth's systems ● Engineering design challenge with written explanation ● Research project on environmental conservation ● Scientific model with written justification ● Oral or multimedia presentation

	explaining scientific evidence ● End-of-unit project Alternative Assessments ● Build and present a 3D model ● Digital slideshow or infographic ● Video explaining an engineering solution ● STEM design portfolio ● Environmental awareness poster or public service announcement (PSA) ● Oral presentation or student conference ● Interactive digital notebook ● Classroom demonstration or simulation ● Choice board project Benchmark Assessments ● District or grade-level common science assessment ● NGSS-style performance assessment ● Quarterly benchmark assessment ● Standards-based assessment aligned to NGSS ● Data analysis task using graphs and scientific evidence ● Engineering design performance task with rubric ● End-of-unit cumulative assessment ● Science portfolio review
STAGE 3: Learning Plan	

Learning Activities/Content: <i>(What is the core content of this unit? What performance tasks/ activities will students do? What skills will students know? Include content that adheres to NJ Administrative Code and Statutes:</i> • <i>Amistad Law</i> • <i>Holocaust Law</i> • <i>LGBTQ/ Disabilities Law)</i>	DEI • Diversity and Inclusion Law (N.J.S.A. 18A:35-4.36a) • 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions. Amistad • 6.1.5.CivicsDP.2: Compare and contrast responses of individuals and groups, past and present, to violations of fundamental rights (e.g., fairness, civil rights, human rights). Diversity and Inclusion • 2.1.5.EH.3: Identify different feelings and emotions that people may experience and how they might express these emotions (e.g., anger, fear, happiness, sadness, hopelessness, anxiety). • 2.1.5.SSH.3: Demonstrate ways to promote dignity and respect for all people (e.g. sexual orientation, gender identity and expression, race, ethnicity, socio-economic status, differing ability, immigration status, family configuration). Holocaust Law • 6.2.2.D.2 Recognize real people and fictional characters who have demonstrated responsible leadership and citizenship and identify the characteristics that have made them good examples. • Students investigate cells using a
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	compound microscope • Students use microscopes to explore unicellular and multicellular organisms, and plant and animal cells. • Students use interactive website to explore the components within a cell and how they work together. Develop a model in which they identify the parts (components: nucleus, chloroplast, cell wall, mitochondria, cell membrane, the function of a cell as a whole) of cells • Project: “A cell is like a _____ “ Students create a poster/model to display their analogy relating each organelle to something in their project (ex.city, park, school, etc) • Students describe the relationships between the parts of cells in terms of their contributions to overall cellular function and the structure of the cell membrane or cell wall and its relationship to the function of the organelles and the whole cell. • Students use the model to identify key differences between plant and animal cells based on structure and function. Build models of both a plant and animal cell and be able to demonstrate key characteristics that define both • Students use interactive website to “Build an organ” using different tissues
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	● Lab: “Dissecting a Chicken Wing”- Students will dissect a chicken wing to observe the different types of tissues present in a wing ● Project: Body Systems- Each group will research an assigned body system in order to create an informative poster about the body system and its function and display it on poster. Each group will then use what they’ve learned to determine how body systems interact with each other. ● Lab: “Can You Trust Your Senses?”- Students will explore three of your sensory receptors: chemoreceptors (taste and smell) and photoreceptors (sight) ● Lab: Response Time: Students will conduct an experiment to test visual, auditory, and tactile reaction times using one ruler. ● Online Interactive: Students explore the process of synapse and how the brain receives and transmits messages. ● Students investigate the genetic diversity found in plants, animals, and ecosystems around the world. ● Discuss how biodiversity strengthens ecosystems and why conserving diverse species is important for environmental health. ● Students examine how environmental factors such as nutrition, clean water, sunlight,
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	climate, and habitat affect the growth of plants and animals. Emphasize that growth is shaped by interactions between genes and environmental conditions. Students explore ethical questions related to biotechnology, including gene therapy, genetically modified crops, CRISPR, and selective breeding. Students evaluate benefits, risks, and diverse viewpoints using scientific evidence and respectful discussion.
Resources: <i>(Include names of texts and all online resources)</i>	Textbook www.NSTA.org www.nextgenscience.org BrainPop Generation Genius Freckle EdPuzzle www.IXL.com www.ck12.org www.openscied.org
Differentiation: <i>(What type of differentiated instruction will be used for each of the following subgroups:</i> 1. Special Education 2. English Language Learners (ELLs) 3. At Risk/BSI 4. Gifted & Talented/Advanced 5. 504	Special Education - Extended time for task completion (Assignments, Assessments, etc..) - Provide copy of accurate notes - Breaking down and chunking assignments - Restating and clarifying instruction - Extra book provided to keep at home - Organizational assistance (notebook, assignment pad, lab materials, etc.) - Option to type instead handwriting notes

	● Adjusting class schedule to alternate instruction (morning/afternoon) ● Modify test and quizzes ● Provide manipulative examples ● Preferential Seating ● Use of Graphic Organizers (charts, visual outlines, etc..) ● Repetition and clarification of directions Assessments and class work read aloud ● Provide checklists ● Movement breaks ● Visual representation of print version ● Use of an alarm/timer to aide with time management, including transitional warning ● Nonverbal cue for off-task behavior ● Provide positive reinforcement ● Hands on learning activities ● Ask student to restate directions or concepts taught ● Deliver directions one step at a time, gradually increasing the number of steps delivered ● Explain the purpose of the assignment to the student ● Provide managed choices to increase on task behavior ● Allow for break passes when needed English Language Learners (ELLs) ● Provide alternate ways for the student to respond (verbal/pictographic answers instead of written) ● Substitute a hands-on activity or use of different media in projects for a written activity ● Provide word banks / word walls
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	● Prepare and distribute advance notes ● Provide model sentence frames and sentence starters for both oral responses and written responses ● Provide additional time to complete assessments and assignments ● Model and use gestures to aid in understanding ● Model tasks by giving one or two examples before releasing students to work independently ● Present instructions both verbally and visually ● Simplify written and verbal instructions Students At-Risk (BSI) ● Extended time for task completion (Assignments, Assessments, etc..) ● Provide copy of accurate notes ● Breaking down and chunking assignments ● Restating and clarifying instruction ● Extra book provided to keep at home ● Organizational assistance (notebook, assignment pad, lab materials, etc.) Gifted and Talented (Advanced) Students: ● Encourage independent studies or investigations ● Encourage creative expression by allowing students to choose how to explore a problem ● Invite students to explore points of view ● Varied levels of reading text ● Enriched hands on center that students can explore independently
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