Califon Public School
Curriculum

Subject: Science	Grade: 7th	Unit #: 1	Pacing: 15 days

Unit Title: Structure and Properties of Matter

OVERVIEW OF UNIT:

In this unit, Students build understandings of what occurs at the atomic and molecular scale. Students apply their understanding that pure substances have characteristic properties and are made from a single type of atom or molecule.

Big Ideas

- Substances are made from different types of atoms.
- Atoms are the basic units of matter.
- Substances combine with one another in various ways.
- Molecules are two or more atoms joined together.
- Atoms form molecules that range in size from two to thousands of atoms.
- Molecules can be simple or very complex.
- Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).
- Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.
- Substances react chemically in characteristic ways.
- In a chemical process, the atoms that make up the original substances are regrouped into different molecules; these new substances have different properties from those of the reactants.
- The analysis of data on the properties of products and reactants can be used to determine whether a chemical process has occurred.
- Density, melting point, boiling point, solubility, flammability, and odor are characteristic properties that can be used to identify a pure substance.
- Macroscopic patterns are related to the nature of the atomic-level structure of a substance.

Essential Questions

- What is the universe made of?
- Is it possible to tell if two substances are mixed or if they reacted with one another?

Objectives

- Students will be able to describe what the universe is composed of.
- Students will be able to determine if two substances are mixed or if they reacted with one another.

Assessment	
Formative Assessment: ● Labs ● Claim-Evidence- Reasoning ● Class Discussions **Summative Assessment:** ● Multiple Choice Assessment ● Open Ended Response ● Claim-Evidence- Reasoning	**Benchmark:** ● LinkIt Benchmark **Alternative:** ● Performance Assessments ● Projects ● Models ● Modified Tests Independently Developed by Teacher

Key Vocabulary
matter, atoms, molecules, electron, proton, neutron, mixtures, compounds, chemical reactions, chemical properties, physical properties

Resources & Materials
Stemscopes website & kits ● Print and digital copies of textbook ● Lab write-ups ● SEP simulations ● Content videos ● PhET Interactive Simulations ● Reading articles ● Math connections ● Pre-assembled Kits

Technology Infusion

Teacher Technology:
- Chromebooks
- Stemscopes website
- Promethean Board

Student Technology:
- Chromebooks
- Stemscopes website

Activities:
- Students will use Chromebooks to access the Stemscopes website to: activate prior knowledge, build schema, watch videos, complete labs, take assessments and collect data.

Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Interdisciplinary Integration	
Activities: ● Students will be able to analyze data in order to create a scientific explanation. ● Students will be able to create a scientific explanation using evidence and reasoning from observation and informational text to support a scientific claim	
Standard	**Standard Description**
NJSLS-ELA AW	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
NJSLS-ELA W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
NJSLS-ELA W.IW.7.2	Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
NJSLS-ELA W.RW.7.7	Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

21st Century Life Skills Standards	
Activities: ● Students will work in groups to collaborate, at times taking leadership roles to communicate project ideas to the whole class.	
Standard	**Student Learning Objectives**
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.

Careers	
Activities: ● Students will collect data to analyze a system.	
Practice	**Description**
Consider the environmental, social and economic impacts of decisions.	Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.

Act as a responsible and contributing community members and employee.	Students understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.
Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-PS1-1	Matter and its Interactions	Develop models to describe the atomic composition of simple molecules and extended structures.	Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of

			atoms.] [Assessment Boundary: Assessment does not include valence electrons and bonding energy, discussing the ionic nature of subunits of complex structures, or a complete depiction of all individual atoms in a complex molecule or extended structure.]
MS-PS1-2	Matter and its Interactions	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	Examples of reactions could include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with hydrogen chloride.] [Assessment Boundary: Assessment is limited to analysis of the following properties: density, melting point, boiling point, solubility, flammability, and odor.]

Differentiation
Students with 504 plans
● Preferential seating ● Guided notes ● Extra time ● Teacher check-ins ● Use graphic organizers ● Redirect attention ● Prioritize tasks ● Small group testing ● Provide modifications & accommodations per individual student's 504 plan
Special Education
● Provide modifications & accommodations as listed in the student's IEP ● Position the student near a helping peer or have quick access to the teacher ● Modify or reduce assignments/tasks ● Reduce the length of the assignment for different modes of delivery ● Increase one-to-one time ● Prioritize tasks ● Use graphic organizers ● Use online resources for skill-building

- Provide teacher notes
- Use collaborative grouping strategies, such as small groups
- NJDOE resources - http://www.state.nj.us/education/specialed/

Response to Intervention (RTI)

- Tiered interventions following the RTI framework
- Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/
- Intervention Central - http://www.interventioncentral.org/

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm
- Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

Califon Public School
Curriculum

Subject: Science	Grade: 7th	Unit #: 2	Pacing: 20 days

Unit Title: Interactions of Matter

OVERVIEW OF UNIT:

In this unit, Students build understandings of what occurs at the atomic and molecular scale. Students apply their understanding that pure substances have characteristic properties and are made from a single type of atom or molecule. They also provide a molecular level accounts to explain states of matter and changes between states.

Big Ideas

- Changes in particle motion, temperature, and state of a pure substance occur when thermal energy is added or removed.
- Qualitative molecular-level models of solids, liquids, and gases can be used to show that adding or removing thermal energy increases or decreases the kinetic energy of the particles until a change of state occurs.
- Gases and liquids are made of molecules or inert atoms that are moving about relative to each other.
- In a liquid, the molecules are constantly in contact with others.
- In a gas, the molecules are widely spaced except when they happen to collide.
- In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations.
- The changes of state that occur with variations in temperature or pressure can be described and predicted using models of matter.
- The term heat as used in everyday language refers both to thermal energy and the transfer of that thermal energy from one object to another.
- Thermal energy is the motion of atoms or molecules within a substance.
- In science, heat is used to refer to the energy transferred due to the temperature difference between two objects.
- The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system's material).
- The details of the relationship between the average internal kinetic energy and the potential energy per atom or molecule depend on the type of atom or molecule and the interactions among the atoms in the material.
- Temperature is not a direct measure of a system's total thermal energy.
- The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material.
- Cause-and-effect relationships may be used to predict and describe changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed in natural systems.

- Each pure substance has characteristic physical and chemical properties that can be used to identify it.
- Substances react chemically in characteristic ways.
- In a chemical process, the atoms that make up the original substances are regrouped into different molecules.
- New substances that result from chemical processes have different properties from those of the reactants.
- Natural resources can undergo a chemical process to form synthetic material.
- Structures can be designed to serve particular functions by taking into account properties of different materials and how materials can be shaped and used.
- Engineering advances have led to discoveries of important synthetic materials, and scientific discoveries have led to the development of entire industries and engineered systems using these materials.
- Technology use varies from region to region and over time.
- The uses of technologies (engineered/synthetic materials) and any limitations on their use are driven by individual or societal needs, desires, and values.
- The uses of technologies (engineered/synthetic materials) and any limitations on their use are driven by the findings of scientific research and by differences in such factors as climate, natural resources, and economic conditions.

Essential Questions

- How can you tell what the molecules are doing in a substance?
- How can we trace synthetic materials back to natural ingredients?

Objectives

- Students will be able to analyze what molecules are doing in a substance.
- Students will be able to trace synthetic materials back to natural ingredients.

Assessment

Formative Assessment:

- Labs
- Claim-Evidence- Reasoning
- Class Discussions

Summative Assessment:

- Multiple Choice Assessment
- Open Ended Response
- Claim-Evidence- Reasoning

Benchmark:

- LinkIt Benchmark

Alternative:

- Performance Assessments
- Projects
- Models
- Modified Tests Independently Developed by Teacher

Key Vocabulary

Polymers, molecules, state of matter, conservation of mass,

Resources & Materials

Stemscopes website & kits

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- SEP simulations
- Content videos
- PhET Interactive Simulations
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Technology Infusion

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Activities:

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8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Interdisciplinary Integration

Activities:

- Students will be able to analyze data in order to create a scientific explanation.
- Students will be able to create a scientific explanation using evidence and reasoning from observation and informational text to support a scientific claim

Standard	Standard Description
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21st Century Life Skills Standards	
Activities: ● Students will work in groups to collaborate, at times taking leadership roles to communicate project ideas to the whole class.	
Standard	**Student Learning Objectives**
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.

Careers	
Activities: ● Students will create scientific explanations to describe observable phenomena in order to communicate findings.	
Practice	**Description**
Consider the environmental, social and economic impacts of decisions.	Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
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and communicate effectively.	technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-PS1-3	Matter and its Interactions	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.] [Assessment Boundary: Assessment is limited to qualitative information.]
MS-PS1-4	Matter and its Interactions	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawings and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.]

Differentiation
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● Preferential seating ● Guided notes ● Extra time ● Teacher check-ins

- Use graphic organizers
- Redirect attention
- Prioritize tasks
- Small group testing
- Provide modifications & accommodations per individual student's 504 plan

Special Education

- Provide modifications & accommodations as listed in the student's IEP
- Position the student near a helping peer or have quick access to the teacher
- Modify or reduce assignments/tasks
- Reduce the length of the assignment for different modes of delivery
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English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm
- Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

Califon Public School
Curriculum

Subject: Science	Grade: 7th	Unit #: 3	Pacing: 25 days

Unit Title: Chemical Reactions

OVERVIEW OF UNIT:

How do substances combine or change (react) to make new substances?
Students provide molecular-level accounts of states of matters and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions. Students also apply their understanding of optimization design and process in engineering to chemical reaction systems.

Big Ideas

- Substances react chemically in characteristic ways.
- In a chemical process, the atoms that make up the original substances are regrouped into different molecules.
- New substances created in a chemical process have different properties from those of the reactants.
- The total number of each type of atom in a chemical process is conserved, and thus the mass does not change (the law of conservation of matter).
- Matter is conserved because atoms are conserved in physical and chemical processes.
- The law of conservation of mass is a mathematical description of natural phenomena.
- Some chemical reactions release energy, while others store energy.
- The transfer of thermal energy can be tracked as energy flows through a designed or natural system.
- Models of all kinds are important for testing solutions.
- There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.
- The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution.
- A solution needs to be tested and then modified on the basis of the test results in order to for it to be improved.
- Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process.
- Some of the characteristics identified as having the best performance may be incorporated into the new design.

Essential Questions

- What happens to the atoms when I bake a cake?
- How can a device be designed, constructed, tested, and modified that either releases or absorbs thermal energy by chemical processes?

Objectives
● Students will be able to describe what happens to atoms when you bake a cake. ● Students will be able to design, construct, test, modify a device that either releases or absorbs thermal energy by chemical processes.

Assessment	
Formative Assessment: ● Labs ● Claim-Evidence- Reasoning ● Class Discussions **Summative Assessment:** ● Multiple Choice Assessment ● Open Ended Response ● Claim-Evidence- Reasoning	**Benchmark:** ● LinkIt Benchmark **Alternative:** ● Performance Assessments ● Projects ● Models ● Modified Tests Independently Developed by Teacher

Key Vocabulary
matter, atoms, molecules, electron, proton, neutron, mixtures, compounds, chemical reactions, chemical properties, physical properties, thermal energy, flammability,

Resources & Materials
Stemscopes website & kits ● Print and digital copies of textbook ● Lab write-ups ● SEP simulations ● Content videos ● PhET Interactive Simulations ● Reading articles ● Math connections ● Pre-assembled Kits

Technology Infusion
Teacher Technology: ● Chromebooks ● Stemscopes website ● Promethean Board **Student Technology:** ● Chromebooks ● Stemscopes website **Activities:**

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Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
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Interdisciplinary Integration

Activities:

- Students will be able to analyze data in order to create a scientific explanation.
- Students will be able to create a scientific explanation using evidence and reasoning from observation and informational text to support a scientific claim

Standard	Standard Description
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21st Century Life Skills Standards

Activities:

- Students will work in groups to collaborate, at times taking leadership roles to communicate project ideas to the whole class.

Standard	Student Learning Objectives
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.

Careers

Activities:

- Students will create scientific explanations to describe observable phenomena in order to communicate findings.

Practice	Description

Consider the environmental, social and economic impacts of decisions.	Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
Act as a responsible and contributing community members and employee.	Students understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
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Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-PS1-5	Matter and its Interactions	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms, that represent atoms.] [Assessment Boundary: Assessment does not include the use of atomic masses, balancing symbolic

			equations, or intermolecular forces.]
MS-PS1-6	Matter and its Interactions	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.] [Assessment Boundary: Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device.]
MS-ETS1-3	Engineering Design	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.	N/A

Differentiation
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Special Education
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- Provide text-to-speech
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- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
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Califon Public School
Curriculum

Subject: Science	Grade: 7th	Unit #: 4	Pacing: 15 days

Unit Title: Structure and Function

OVERVIEW OF UNIT:

Students demonstrate age appropriate abilities to plan and carry out investigations to develop *evidence* that living organisms are made of cells. Students gather information to support explanations of the relationship between structure and function in cells. They are able to communicate an understanding of cell theory and understand that all organisms are made of cells. Students understand that special structures are responsible for particular functions in organisms. They then are able to use their understanding of cell theory to develop and use physical and conceptual models of cells.

Big Ideas

- Distinguish between living and nonliving things.
- Cells are the smallest unit of life that can be said to be alive.
- All living things are made up of cells, either one cell or many different numbers and types of cells.
- Organisms may consist of one single cell (unicellular).
- Nonliving things can be composed of cells.
- Organisms may consist of many different numbers and types of cells (multicellular).
- Cells that can be observed at one scale may not be observable at another scale.
- Engineering advances have led to important discoveries in the field of cell
- biology, and scientific discoveries have led to the development of entire industries and engineered systems.
- The cell functions as a whole system.
- Identify parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.
- Within cells, special structures are responsible for particular functions.
- Within cells, the cell membrane forms the boundary that controls what enters and leaves the cell.
- Complex and microscopic structures and systems in cells can be visualized, modeled, and used to describe how the function of the cell depends on the relationships among its parts.
- Complex natural structures/systems can be analyzed to determine how they function.
- A model can be used to describe the function of a cell as a whole.
- A model can be used to describe how parts of cells contribute to the cell's function.
- The structures of the cell wall and cell membrane are related to their function.

Essential Questions

- How will astrobiologists know if they have found life elsewhere in the solar system?
- How do the functions of cells support an entire organism?

Objectives
• Students will be able to determine the factors that support life • Students will be able to explain the function of cells in order to determine how they support an entire organism.

Assessment	
Formative Assessment: • Labs • Claim-Evidence- Reasoning • Class Discussions **Summative Assessment:** • Multiple Choice Assessment • Open Ended Response • Claim-Evidence- Reasoning	**Benchmark:** • LinkIt Benchmark **Alternative:** • Performance Assessments • Projects • Models • Modified Tests Independently Developed by Teacher

Key Vocabulary
cells, organelles, system, function, cell membrane, cell wall, mitochondria, vacuole, endoplasmic reticulum, chloroplasts, DNA

Resources & Materials
Stemscopes website & kits • Print and digital copies of textbook • Lab write-ups • SEP simulations • Content videos • PhET Interactive Simulations • Reading articles • Math connections • Pre-assembled Kits

Technology Infusion
Teacher Technology: • Chromebooks • Stemscopes website • Promethean Board **Student Technology:** • Chromebooks • Stemscopes website **Activities:**

- Students will use Chromebooks to access the Stemscopes website to: activate prior knowledge, build schema, watch videos, complete labs, take assessments and collect data.

Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Interdisciplinary Integration

Activities:

- Students will be able to analyze data in order to create a scientific explanation.
- Students will be able to create a scientific explanation using evidence and reasoning from observation and informational text to support a scientific claim

Standard	Standard Description
NJSLS-ELA AW	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
NJSLS-ELA W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
NJSLS-ELA W.IW.7.2	Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
NJSLS-ELA W.RW.7.7	Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

21st Century Life Skills Standards

Activities:

- Students will work in groups to collaborate, at times taking leadership roles to communicate project ideas to the whole class.

Standard	Student Learning Objectives
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.

Careers

Activities:

- Students will create scientific explanations to describe observable phenomena in order to communicate findings.

Practice	Description

Consider the environmental, social and economic impacts of decisions.	Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
Act as a responsible and contributing community members and employee.	Students understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.
Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-LS1-1	From Molecules to Organisms: Structures and Processes	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.]

MS-LS1-2	From Molecules to Organisms: Structures and Processes	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.] [Assessment Boundary: Assessment of organelle structure/function relationships is limited to the cell wall and cell membrane. Assessment of the function of the other organelles is limited to their relationship to the whole cell. Assessment does not include the biochemical function of cells or cell parts.]

Differentiation
Students with 504 plans
• Preferential seating • Guided notes • Extra time • Teacher check-ins • Use graphic organizers • Redirect attention • Prioritize tasks • Small group testing • Provide modifications & accommodations per individual student's 504 plan
Special Education
• Provide modifications & accommodations as listed in the student's IEP • Position the student near a helping peer or have quick access to the teacher • Modify or reduce assignments/tasks • Reduce the length of the assignment for different modes of delivery • Increase one-to-one time • Prioritize tasks • Use graphic organizers • Use online resources for skill-building • Provide teacher notes • Use collaborative grouping strategies, such as small groups • NJDOE resources - http://www.state.nj.us/education/specialed/

Response to Intervention (RTI)
• Tiered interventions following the RTI framework • Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ • Intervention Central - http://www.interventioncentral.org/
English Language Learners (ELL)
• Provide text-to-speech • Use of a translation dictionary or software • Provide graphic organizers • NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm • Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm
Enrichment
• Process should be modified: higher order thinking skills, open-ended thinking, discovery • Utilize project-based learning for greater depth of knowledge • Utilize exploratory connections to higher-grade concepts • Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations • Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied • NJDOE resources

Califon Public School
Curriculum

Subject: Science	Grade: 7th	Unit #: 5	Pacing: 30 days

Unit Title: Body Systems

OVERVIEW OF UNIT:

Students develop a basic understanding of the role of cells in body systems and how those systems work to support the life functions of the organism. Students will construct explanations for the interactions of systems in cells and organisms. Students understand that special structures are responsible for particular functions in organisms, and that for many organisms, the body is a system of multiple-interaction subsystems that form a hierarchy, from cells to the body. Students construct explanations for the interactions of systems in cells and organisms and for how organisms gather and use information from the environment. The crosscuttings concepts of *systems and system models* and *cause and effect* provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in *engaging in argument from evidence* and *obtaining, evaluating, and communicating information*. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

Big Ideas

- In multicellular organisms, the body is a system of multiple, interacting subsystems.
- Subsystems are groups of cells that work together to form tissues.
- Organs are groups of tissues that work together to perform a particular body function.
- Tissues and organs are specialized for particular body functions.
- Systems may interact with other systems.
- Systems may have subsystems and be part of larger complex systems.
- Interactions are limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.
- Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas.
- Sense receptors respond to different inputs (electromagnetic, mechanical, chemical).
- Sense receptors transmit responses as signals that travel along nerve cells to the brain.
- Signals are then processed in the brain.
- Brain processing results in immediate behaviors or memories.
- Cause-and-effect relationships may be used to predict response to stimuli in natural systems.

Essential Questions

- What is the evidence that a body is actually a system of interacting subsystems composed of groups of interacting cells?
- How do organisms receive and respond to information from their environment?

Objectives
• Students will be able to provide evidence that the body is a system of interacting subsystems composed of groups of interacting cells. • Students will be able to describe how organisms receive and respond to information from their environment.

Assessment	
Formative Assessment: • Labs • Claim-Evidence- Reasoning • Class Discussions **Summative Assessment:** • Multiple Choice Assessment • Open Ended Response • Claim-Evidence- Reasoning • Frog Dissection	**Benchmark:** • LinkIt Benchmark **Alternative:** • Performance Assessments • Projects • Models • Modified Tests Independently Developed by Teacher

Key Vocabulary
tissues, organs, interacting systems, specialized cells, nervous system, stimuli, sensory receptors

Resources & Materials
Stemscopes website & kits • Print and digital copies of textbook • Lab write-ups • SEP simulations • Content videos • PhET Interactive Simulations • Reading articles • Math connections • Pre-assembled Kits

Technology Infusion
Teacher Technology: • Chromebooks • Stemscopes website • Promethean Board **Student Technology:** • Chromebooks • Stemscopes website **Activities:**

• Students will use Chromebooks to access the Stemscopes website to: activate prior knowledge, build schema, watch videos, complete labs, take assessments and collect data.

Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Interdisciplinary Integration
Activities: • Students will be able to analyze data in order to create a scientific explanation. • Students will be able to create a scientific explanation using evidence and reasoning from observation and informational text to support a scientific claim

Standard	Standard Description
NJSLS-ELA AW	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
NJSLS-ELA W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
NJSLS-ELA W.IW.7.2	Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
NJSLS-ELA W.RW.7.7	Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

21st Century Life Skills Standards
Activities: • Students will work in groups to collaborate, at times taking leadership roles to communicate project ideas to the whole class.

Standard	Student Learning Objectives
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.

Careers
Activities: • Students will create scientific explanations to describe observable phenomena in order to communicate findings.

Practice	Description

Consider the environmental, social and economic impacts of decisions.	Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
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Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-LS1-3	From Molecules to Organisms: Structures and Processes	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal

			functioning of those systems.] [Assessment Boundary: Assessment does not include the mechanism of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.]
MS-LS1-8	From Molecules to Organisms: Structures and Processes	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	[Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.]

Differentiation
Students with 504 plans
• Preferential seating • Guided notes • Extra time • Teacher check-ins • Use graphic organizers • Redirect attention • Prioritize tasks • Small group testing • Provide modifications & accommodations per individual student's 504 plan
Special Education
• Provide modifications & accommodations as listed in the student's IEP • Position the student near a helping peer or have quick access to the teacher • Modify or reduce assignments/tasks • Reduce the length of the assignment for different modes of delivery • Increase one-to-one time • Prioritize tasks • Use graphic organizers • Use online resources for skill-building • Provide teacher notes • Use collaborative grouping strategies, such as small groups • NJDOE resources - http://www.state.nj.us/education/specialed/
Response to Intervention (RTI)
• Tiered interventions following the RTI framework

- Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/
- Intervention Central - http://www.interventioncentral.org/

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm
- Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

Califon Public School
Curriculum

Subject: Science	Grade: 7th	Unit #: 6	Pacing: 20 days

Unit Title: Inheritance and Variations of Traits

OVERVIEW OF UNIT:

Why do kids look similar to their parents?
Students develop and use models to describe how gene mutations and sexual reproduction contribute to genetic variation. Students understand how genetic factors determine the growth of an individual organism. They also demonstrate understanding of the genetic implications of sexual and asexual reproduction. The crosscutting concepts of cause and effect and structure and function provide a framework for understanding how gene structure determines differences in the functioning of organisms.

Big Ideas

- Complex and microscopic structures and systems, such as genes located on chromosomes, can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among the parts of the system; therefore, complex natural structures/systems can be analyzed to determine how they function.
- Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes.
- Each distinct gene chiefly controls the production of specific proteins, which in turn affect the traits of the individual.
- In addition to variations that arise from sexual reproduction, genetic information can be altered due to mutations.
- Some changes to genetic material are beneficial, others harmful, and some neutral to the organism.
- Changes in genetic material may result in the production of different proteins.
- Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits.
- 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
- Though rare, mutations may result in changes to the structure and function of proteins.
- Organisms reproduce either sexually or asexually and transfer their genetic information to their offspring.
- Asexual reproduction results in offspring with identical genetic information.
- Sexual reproduction results in offspring with genetic variation.
- Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.
- In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring.

- Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other.
- Punnett squares, diagrams, and simulations can be used to describe the cause-and-effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.

Essential Questions

- How do structural changes to genes (mutations) located on chromosomes affect proteins or affect the structure and function of an organism?
- How do asexual reproduction and sexual reproduction affect the genetic variation of offspring?

Objectives

- Students will be able to explain how structural changes to genes on chromosomes affect proteins or affect the structure and function of an organism.
- Students will be able to compare how sexual and asexual reproduction affects the genetic variation of offspring.

Assessment

Formative Assessment:

- Labs
- Claim-Evidence- Reasoning
- Class Discussions

Summative Assessment:

- Multiple Choice Assessment
- Open Ended Response
- Claim-Evidence- Reasoning

Benchmark:

- LinkIt Benchmark

Alternative:

- Performance Assessments
- Projects
- Models
- Modified Tests Independently Developed by Teacher

Key Vocabulary

Sexual reproduction, asexual reproduction, mutation, genetic variation,

Resources & Materials

Stemscopes website & kits

- Print and digital copies of textbook
- Lab write-ups
- SEP simulations
- Content videos
- PhET Interactive Simulations
- Reading articles
- Math connections
- Pre-assembled Kits

Technology Infusion

Teacher Technology:

- Chromebooks
- Stemscopes website
- Promethean Board

Student Technology:

- Chromebooks
- Stemscopes website

Activities:

- Students will use Chromebooks to access the Stemscopes website to: activate prior knowledge, build schema, watch videos, complete labs, take assessments and collect data.

Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Interdisciplinary Integration

Activities:

- Students will be able to analyze data in order to create a scientific explanation.
- Students will be able to create a scientific explanation using evidence and reasoning from observation and informational text to support a scientific claim

Standard	Standard Description
NJSLS-ELA AW	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
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21st Century Life Skills Standards

Activities:

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Standard	Student Learning Objectives
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.

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Careers	
Activities: ● Students will create scientific explanations to describe observable phenomena in order to communicate findings.	
Practice	**Description**
Consider the environmental, social and economic impacts of decisions.	Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
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Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-LS3-1	Heredity: Inheritance and Variation of Traits	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.	Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins.] [Assessment Boundary: Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.]
MS-LS3-2	Heredity: Inheritance and Variation of Traits	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.	Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.]

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- NJDOE resources - http://www.state.nj.us/education/specialed/

Response to Intervention (RTI)

- Tiered interventions following the RTI framework
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- Intervention Central - http://www.interventioncentral.org/

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm
- Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

Califon Public School
Curriculum

Subject: Science	Grade: 7th	Unit #: 7	Pacing: 15 days

Unit Title: Organization for Matter and Energy Flow in Organisms

OVERVIEW OF UNIT:

Students provide a mechanistic account for how cells provide a structure for the plant process of photosynthesis in the movement of matter and energy needed for the cell. Students use conceptual and physical models to explain the transfer of energy and cycling of matter as they construct explanations for the role of photosynthesis in cycling matter in ecosystems. They construct scientific explanations for the cycling of matter in organisms and the interactions of organisms to obtain matter and energy from an ecosystem to survive and grow. They understand that sustaining life requires substantial energy and matter inputs, and that the structure and functions of organisms contribute to the capture, transformation, transport, release, and elimination of matter and energy.

Big Ideas

- Photosynthesis has a role in the cycling of matter and flow of energy into and out of organisms.
- The flow of energy and cycling of matter can be traced.
- The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon based organic molecules and release oxygen.
- Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen.
- Sugars produced by plants can be used immediately or stored for growth or later use.
- Within a natural system, the transfer of energy drives the motion and/or cycling of matter.
- Food is rearranged through chemical reactions, forming new molecules that support growth.
- Food is rearranged through chemical reactions, forming new molecules that release energy as this matter moves through an organism.
- Molecules are broken apart and put back together to form new substances, and in this process, energy is released.
- Cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy.

Essential Questions

- What is the role of photosynthesis in the cycling of matter and flow of energy into and out of an organism?
- How is food rearranged through chemical reactions to form new molecules that support growth and/or release energy as this matter moves through an organism?

Objectives
• Students will be able to determine the role of photosynthesis in the cycling of matter and flow of energy into and out of an organism. • Students will be able to describe how food is rearranged through chemical reactions to form new molecules that support growth and/or release energy as this matter moves through an organism.

Assessment	
Formative Assessment: • Labs • Claim-Evidence- Reasoning • Class Discussions **Summative Assessment:** • Multiple Choice Assessment • Open Ended Response • Claim-Evidence- Reasoning	**Benchmark:** • LinkIt Benchmark **Alternative:** • Performance Assessments • Projects • Models • Modified Tests Independently Developed by Teacher

Key Vocabulary
Photosynthesis, cellular respiration, chemical reactions, molecules

Resources & Materials
Stemscopes website & kits • Print and digital copies of textbook • Lab write-ups • SEP simulations • Content videos • PhET Interactive Simulations • Reading articles • Math connections • Pre-assembled Kits

Technology Infusion
Teacher Technology: • Chromebooks • Stemscopes website • Promethean Board **Student Technology:** • Chromebooks • Stemscopes website **Activities:**

- Students will use Chromebooks to access the Stemscopes website to: activate prior knowledge, build schema, watch videos, complete labs, take assessments and collect data.

Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Interdisciplinary Integration

Activities:

- Students will be able to analyze data in order to create a scientific explanation.
- Students will be able to create a scientific explanation using evidence and reasoning from observation and informational text to support a scientific claim

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NJSLS-ELA W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
NJSLS-ELA W.IW.7.2	Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
NJSLS-ELA W.RW.7.7	Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

21st Century Life Skills Standards

Activities:

- Students will work in groups to collaborate, at times taking leadership roles to communicate project ideas to the whole class.

Standard	Student Learning Objectives
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.

Careers

Activities:

- Students will explain the consequences of human movement and development on the Earth.

Practice	Description
Consider the environmental, social	Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people,

and economic impacts of decisions.	organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
Act as a responsible and contributing community members and employee.	Students understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.
Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-LS1-6	From Molecules to Organisms: Structures and Processes	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	Emphasis is on tracing movement of matter and flow of energy.] [Assessment Boundary: Assessment does not include the biochemical mechanisms of photosynthesis.]
MS-LS1-7	From Molecules to Organisms: Structures and Processes	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that	Emphasis is on describing that molecules are broken apart and put back together and that in this process,

		support growth and/or release energy as this matter moves through an organism.	energy is released.] [Assessment Boundary: Assessment does not include details of the chemical reactions for photosynthesis or respiration.]

Differentiation
Students with 504 plans
• Preferential seating • Guided notes • Extra time • Teacher check-ins • Use graphic organizers • Redirect attention • Prioritize tasks • Small group testing • Provide modifications & accommodations per individual student's 504 plan
Special Education
• Provide modifications & accommodations as listed in the student's IEP • Position the student near a helping peer or have quick access to the teacher • Modify or reduce assignments/tasks • Reduce the length of the assignment for different modes of delivery • Increase one-to-one time • Prioritize tasks • Use graphic organizers • Use online resources for skill-building • Provide teacher notes • Use collaborative grouping strategies, such as small groups • NJDOE resources - http://www.state.nj.us/education/specialed/
Response to Intervention (RTI)
• Tiered interventions following the RTI framework • Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ • Intervention Central - http://www.interventioncentral.org/
English Language Learners (ELL)
• Provide text-to-speech • Use of a translation dictionary or software • Provide graphic organizers • NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm • Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment
● Process should be modified: higher order thinking skills, open-ended thinking, discovery ● Utilize project-based learning for greater depth of knowledge ● Utilize exploratory connections to higher-grade concepts ● Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations ● Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied ● NJDOE resources

Califon Public School
Curriculum

Subject:	Grade:	Unit #:	Pacing:
Science	7th	8	30 days

Unit Title: Earth Systems

OVERVIEW OF UNIT:

Students examine geoscience data in order to understand processes and events in Earth's history. Important crosscutting concepts in this unit are scale, proportion, and quantity, stability and change, and patterns in relation to the different ways geologic processes operate over geologic time. An important aspect of the history of Earth is that geologic events and conditions have affected the evolution of life, but different life forms have also played important roles in altering Earth's systems. Students understand how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems. Students investigate the controlling properties of important materials and construct explanations based on the analysis of real geoscience data.

Big Ideas

- The geologic time scale is used to organize Earth's 4.6-billion-year-old history.
- Rock formations and the fossils they contain are used to establish relative ages of major events in Earth's history.
- The geologic time scale interpreted from rock strata provides a way to organize Earth's history.
- Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.
- Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.
- Energy drives the process that results in the cycling of Earth's materials.
- The processes of melting, crystallization, weathering, deformation, and sedimentation act together to form minerals and rocks through the cycling of Earth's materials.
- All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems.
- Energy flowing and matter cycling within and among the planet's systems derive from the sun and Earth's hot interior.
- Energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms.
- Explanations of stability and change in Earth's natural systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.
- Geoscience processes have changed Earth's surface at varying time and spatial scales.
- Processes change Earth's surface at time and spatial scales that can be large or small; many geoscience processes usually behave gradually but are punctuated by catastrophic events.
- Geoscience processes shape local geographic features.
- The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years.

- Interactions among Earth's systems have shaped Earth's history and will determine its future.
- Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations.
- Time, space, and energy phenomena within Earth's systems can be observed at various scales using models to study systems that are too large or too small.
- Tectonic processes continually generate new sea floor at ridges and destroy old sea floor at trenches.
- Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.
- Patterns in rates of change and other numerical relationships can provide information about past plate motions.
- The distribution of fossils and rocks, continental shapes, and sea floor structures to provide evidence of past plate motions.
- Similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches) provide evidence of past plate motions.

Essential Questions

- How do we know that the Earth is approximately 4.6-billion-year-old history?
- What drives the cycling of Earth's materials?
- Do all of the changes to Earth systems occur in similar time scales?
- How is it possible for the same kind of fossils to be found in New Jersey and in Africa?

Objectives

- Students will be able to describe how we know that the Earth is approximately 4.6 billion years old.
- Students will be able to identify what drives the cycling of Earth's materials.
- Students will be able to compare time scales in changes to Earth's systems.
- Students will be able to describe how it is possible for the same kind of fossils in New Jersey and in Africa

Assessment

Formative Assessment:

- Labs
- Claim-Evidence- Reasoning
- Class Discussions

Summative Assessment:

- Multiple Choice Assessment
- Open Ended Response
- Claim-Evidence- Reasoning

Benchmark:

- LinkIt Benchmark

Alternative:

- Performance Assessments
- Projects
- Models
- Modified Tests Independently Developed by Teacher

Key Vocabulary

Geologic time scale, rock strata, stratigraphy, geoscience, plate tectonics, pangea, fossils

Resources & Materials
Stemscopes website & kits • Print and digital copies of textbook • Lab write-ups • SEP simulations • Content videos • PhET Interactive Simulations • Reading articles • Math connections • Pre-assembled Kits

Technology Infusion
Teacher Technology: • Chromebooks • Stemscopes website • Promethean Board **Student Technology:** • Chromebooks • Stemscopes website **Activities:** • Students will use Chromebooks to access the Stemscopes website to: activate prior knowledge, build schema, watch videos, complete labs, take assessments and collect data.

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Activities: ● Students will explain the consequences of human movement and development on the Earth.	
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increase collaboration and communicate effectively.	adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
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Standards			
Standard #	**Standard Description**	**Student Learning Objective**	**Clarification Statement**
MS-ESS1-4	Earth's Place in the Universe	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	Emphasis is on how analyses of rock formations and the fossils they contain are used to establish relative ages of major events in Earth's history. Examples of Earth's major events could range from being very recent (such as the last Ice Age or the earliest fossils of homo sapiens) to very old (such as the formation of Earth or the earliest evidence of life). Examples can include the formation of mountain chains and ocean basins, the evolution or extinction of particular living organisms, or significant volcanic eruptions.] [Assessment Boundary: Assessment does not include recalling the names of specific periods or epochs and events within them.]
MS-ESS2-1	Earth's Systems	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.] [Assessment Boundary: Assessment does not include the identification and naming of minerals.]

MS-ESS2-2	Earth's Systems	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events. Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]
MS-ESS2-3	Earth's Systems	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	Examples of data include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).] [Assessment Boundary: Paleomagnetic anomalies in oceanic and continental crust are not assessed.]

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● Preferential seating ● Guided notes ● Extra time ● Teacher check-ins ● Use graphic organizers ● Redirect attention ● Prioritize tasks

- Small group testing
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- Increase one-to-one time
- Prioritize tasks
- Use graphic organizers
- Use online resources for skill-building
- Provide teacher notes
- Use collaborative grouping strategies, such as small groups
- NJDOE resources - http://www.state.nj.us/education/specialed/

Response to Intervention (RTI)

- Tiered interventions following the RTI framework
- Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/
- Intervention Central - http://www.interventioncentral.org/

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
- NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm
- Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
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