Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

SPARTAN MISSION:
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DEPARTMENT: **Science** COURSE: **Science, Grade 8**

Curriculum Development Timeline

School: Township of Ocean Intermediate School

Course: Science, Grade 8

Department: Science

Board Approval	Supervisor	Notes
December 2008	Patrick Sullivan	Born Date
August 2011	Patrick Sullivan	Revisions
May 2016	Patrick Sullivan	Revisions
July 2017	Patrick Sullivan	Revisions
March 2019	Patrick Sullivan	Review
August 2022	Patrick Sullivan	Alignment to Standards
August 2024	Patrick Sullivan	Updated to include New State Mandates

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Township of Ocean Pacing Guide			
Week	**Quarter 1**	**Week**	**Quarter 3**
1	Scientific Practice/ Engineering-Design	21	Physical Science: Project Lead The Way - Applied Physics
2	Scientific Practice/ Engineering-Design	22	Physical Science: Project Lead The Way - Applied Physics
3	Physical Science: Newton's Three Laws	23	Physical Science: Project Lead The Way - Applied Physics
4	Physical Science: Motion and Forces	24	Structure and Properties of Matter: Project Lead The Way - Nanotechnology
5	Physical Science: Motion and Forces	25	Structure and Properties of Matter: Project Lead The Way - Nanotechnology
6	Physical Science: Motion and Forces	26	Structure and Properties of Matter: Atomic Composition of Simple Molecules
7	Physical Science: Electric and Magnetic Forces/Gravitational Interactions	27	Structure and Properties of Matter: Atomic Composition of Extended Structures
8	Physical Science: Kinetic and Potential Energy	28	Structure and Properties of Matter: Synthetic Materials Functions
9	Physical Science: Kinetic and Potential Energy	29	Structure and Properties of Matter: Cause and Effect Relationships
10	Physical Science: Energy Transfer	30	Structure and Properties of Matter: Cause and Effect Relationships
Week	**Quarter 2**	**Week**	**Quarter 4**
11	Physical Science: Energy Transfer	31	Chemical Reactions: Project Lead The Way - Applied Chemistry
12	Physical Science: Energy in Waves	32	Chemical Reactions: Project Lead The Way - Applied Chemistry
13	Physical Science: Waves - Reflected, Absorbed, and Transmitted	33	Chemical Reactions: Physical and Chemical Properties
14	Physical Science: Engineering - Design Project: Roller Coasters	34	Chemical Reactions: Physical and Chemical Properties

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DEPARTMENT: **Science** COURSE: **Science, Grade 8**

15	Physical Science: Engineering - Design Project: Roller Coasters	35	Chemical Reactions: Macroscopic Patterns
16	Physical Science: Engineering - Design Project: Roller Coasters	36	Chemical Reactions: Conservation of Matter
17	Physical Science: Project Lead The Way - Physics	37	Chemical Reactions: Energy and Matter
18	Physical Science: Project Lead The Way - Physics	38	Chemical Reactions: Developing Possible Solutions
19	Physical Science: Project Lead The Way - Physics	39	Chemical Reactions: Optimizing the Design Solution
20	Physical Science: Project Lead The Way - Physics	40	Final Benchmark

Climate Change: Chemical Reactions (NJSLS-S: MS-ESS3-5)

Core Instructional & Supplemental Materials including various levels of Texts

No Text Used - All digital resources

Digital Resources Across All Levels: (D=differentiated)
Edpuzzle (D)
Gizmo (D)
Generation Genius
Science World Articles
YouTube Streaming Videos
PhET Interactive Simulations (D)
Ted Talks

Time Frame	**Unit 1-A (2 weeks)**

Topic

Science Practices:

- Understand Science Explanations
- Generate Scientific Evidence through Active Investigation
- Reflect on Scientific Knowledge
- Participate Productively in Science
- Students can articulate the importance of accurate data collection and record keeping in science.

DEPARTMENT: **Science** COURSE: **Science, Grade 8**

- Students are able to demonstrate good practices for data collection and identify common sources of error.

Alignment to Standards

MS-PS1-5: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
MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Learning Objectives and Activities

Learning Objectives:

- How do we build and refine models that describe and explain the natural and designed world?
- What constitutes useful scientific evidence?
- How does scientific knowledge benefit, deepen and broaden from scientists sharing and debating ideas and information with peers?
- Measurement and observation tools are used to categorize, represent and interpret the natural world.
- Evidence is used for building, refining and/or critiquing scientific explanations.

Learning Activities:

- Lab Safety Activity
- Claim Evidence Reasoning Introductory Activity
- Reading and Creating graphs
- Engaging in arguments from evidence - Escape Room
- Generate, discuss, analyze and interpret data
- Analyze and compare data from two lab experiments to distinguish if the hypothesis supports the variables being tested
- Reading the Meniscus Station Lab Activity
- Metric Measurement Lab

Assessments

Formative:

- Reading the Meniscus Station Lab Activity
- Claim, Evidence, Reasoning exit slips
- Analyze and interpret data to determine similarities and differences in findings

- Engage in both spoken and written explanations and argumentation

Summative:

- Analyze and interpret data to provide evidence for phenomena
- Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Benchmark:

- Science reasoning skills (interpreting graphics)

Alternative:

- Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.

Interdisciplinary Connections

- Recognize and represent proportional relationships between quantities
- Reason abstractly and quantitatively
- MP.4 Model with mathematics

New Jersey Student Learning Standards

ELA:

RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) to strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

W.SE.8.6 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

SL.II.8.2. Analyze the purpose of information presented in diverse media formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

Mathematics:

8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

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DEPARTMENT: **Science** COURSE: **Science, Grade 8**

Career Readiness, Life Literacies, and Key Skills
9.1.5.TL.2 Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
Technology Integration
8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem. **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).
Career Education
CRP2. Apply appropriate academic and technical skills. **CRP4.** Communicate clearly and effectively and with reason. **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them. **CRP11.** Use technology to enhance productivity.

Time Frame	**Unit 1-B (21 weeks)**

Topic

Physical Science:

- Forces and Interactions, Energy, Waves and Electromagnetic Radiation
- Engineering - Design Project
- Project Lead The Way - Applied Physics

Science Practices:

- Students are able to describe how science and engineering involve creative processes that include generating and testing ideas, making observations and formulating explanations; and can apply these processes in their own investigations.

Alignment to Standards

MS-PS2-1:Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
MS-PS2-2:Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
MS-PS2-4:Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
MS-PS2-5:Conduct an investigation and evaluate the experimental design to provide

evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
MS-PS3-1:Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
MS-PS3-2: Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system
MS-PS3-5:Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object
MS-PS4-1:Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave
MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
MS-ETS1-3: Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
MS-ETS1-4: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Learning Objectives and Activities

Learning Objectives:

- For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's Third Law).
- The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion.
- All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to share information with other people, these choices must also be shared.
- Forces that act at a distance (electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object or a ball, respectively).
- Gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass, e.g., Earth and the Sun.

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DEPARTMENT: **Science** COURSE: **Science, Grade 8**

Learning Activities:

- Forces and Motion Activities
- Photogate labs using a car and ramp
- Constructing Explanations
- Engaging in argument from evidence
- Planning and carrying out investigations
- Analyze and interpret data
- Developing models
- Refining models
- Generate, discuss, and analyze data
- Engage in both spoken and written explanations and argumentation
- Reflect on their own understanding
- Project Lead The Way
    - Simple Machines Scavenger Hunt
    - Roller Coaster Design & Modeling
    - Rube Goldberg Activity
- Energy Photogate Lab Data including line graph
- Friction Lab - Bar Graph

Assessments

Formative:

- Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
- Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
- Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

Summative:

- Rollercoaster Challenge
    - Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
    - Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

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Benchmark: Physical Science Final (Motion, Forces & Energy)

Alternative:

- Project Lead The Way - Simple Machines Scavenger Hunt, Roller Coaster Design & Modeling, Rube Goldberg Activity, and labels of final product.

Interdisciplinary Connections

New Jersey Student Learning Standards

ELA:
RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) to strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.
RI.IT.8.3. Analyze how particular elements of a text interact (e.g., how contexts influence individuals or events, or how individuals influence ideas or events) across multiple text types, including across literary and informational texts.
W.SE.8.6 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
SL.II.8.2. Analyze the purpose of information presented in diverse media formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

Mathematics:
8.EE.C.8b Solve systems of two linear equations in two variables using the substitution method and estimate solutions by graphing the equations. Solve simple cases by Inspection.
8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
7.EE.B.4a Solve word problems leading to equations of the form px + q = r and p(x+q)=r , where p, q, and r are specific rational numbers. Solve equations of these forms with accuracy and efficiency. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
A.REI.C.6 Solve systems of linear equations algebraically (include using the elimination

method) and graphically, focusing on pairs of linear equations in two variables.

Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change,and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
9.1.5.TL.2 Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).

Technology Integration

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.1: Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.
8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.
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).
8.2.8.ED.4: Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team
8.2.8.ED.7: Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).

Career Education

CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11. Use technology to enhance productivity.
CRP12. Work productively in teams while using cultural global competence.

Time Frame	**Unit 2 (7 weeks)**

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Topic

Chemistry:
- Structure and Properties of Matter
- Project Lead The Way - Nanotechnology

Alignment to Standards

MS-PS1-1:Develop models to describe the atomic composition of simple molecules and extended structures.
MS-PS1-3:Gather and make sense of information to describe that synthetic materials come from natural resources and impact society
MS-PS1-4: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.

Learning Objectives and Activities

Learning Objectives:
- Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms.
- The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter.
- Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules and these new substances have different properties from those of the reactants.
- Cause and effect relationships may be used to predict phenomena in natural or designed systems.
- Structures can be designed to serve particular functions by taking into account properties of different materials and how materials can be shaped and used.

Learning Activities:
- Molecules in Motion
- States of Matter Basics
- Build-a-Molecule
- Topic Activities
  - “Compounds vs. Mixtures”
  - “Classifying Matter”
  - “Phases of Matter Cartoon”
  - “Arranging the Elements”
  - “A World Famous Table”

DEPARTMENT: **Science** COURSE: **Science, Grade 8**

- Project/Performance Assessments - “Elemental Superhero”
- Project Lead The Way -The Science of Technology
  - Nanotechnology - Fact or Myth?
  - How Small is a Billionth?
  - Exploring Nano Products
  - Testing Nano-fabrics

Assessments

Formative:

- C-E-R exit slips
- Class Discussions: abstract vs. quantitative

Summative:

- Develop models to describe the atomic composition of simple molecules and extended structures.
- Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
- 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.

Benchmark: Integrated Chemistry Final focusing on the Periodic Table Model

Alternative:

- Gather, read and synthesize information from multiple appropriate sources and assess the credibility, accuracy and possible bias of each publication and methods used and describe how they are supported or not supported by evidence.

Interdisciplinary Connections

New Jersey Student Learning Standards

ELA:

L.VL.8.3. Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, including technical meanings, choosing flexibly from a range of strategies.

A. Use context (e.g., the overall meaning of a sentence or paragraph; a word’s position or function in a sentence) as a clue to the meaning of a word or phrase.

C. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word

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DEPARTMENT: **Science** COURSE: **Science, Grade 8**

RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) to strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.
RI.IT.8.3. Analyze how particular elements of a text interact (e.g., how contexts influence individuals or events, or how individuals influence ideas or events) across multiple text types, including across literary and informational texts.
W.AW.8.1. Write arguments on discipline- specific content (e.g. social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

- **A.** Introduce claim(s) about a topic or issue, acknowledge and distinguish alternate opposing claims, and organize the reasons and evidence logically.
- **B.** Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

RI.CT.8.8. Analyze and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) two or more informational texts that provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.
W.SE.8.6 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
SL.II.8.2. Analyze the purpose of information presented in diverse media formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

Mathematics:

.**6.G.A.4** Represent three-dimensional figures (e.g., pyramid, triangular prism, rectangular prism) using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
9.1.5.TL.2 Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).

Technology Integration

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8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.
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).

Career Education

CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11. Use technology to enhance productivity.

Time Frame	**Unit 3 (9 weeks)**

Topic

Chemistry:
- Chemical Reactions
- Project Lead The Way - Applied Chemistry

Alignment to Standards

MS-PS1-2:Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
MS-PS1-5: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.
MS-PS1-6:Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.
MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused climate change over the past century.

Learning Objectives and Activities

Learning Objectives:
- How does the conservation of mass apply to the interaction of materials in a closed system?
- How do properties of materials determine their use?
- 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 and these new substances have different properties from those of the reactants.

DEPARTMENT: **Science** COURSE: **Science, Grade 8**

- 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.
- Diagram the workings of the carbon cycle.
- Discuss the relationship between the chemistry of the atmosphere and climate change.

Learning Activities:

- Molecules in Motion
- Physical & Chemical Changes Station Lab
- Gizmos Lab - pH analysis
- Gizmos Lab - Changes is States of Matter
- Combining Elements to Form a Compound
- Periodic Table Color Coding
- Generate, discuss and analyze data
- Examples of the Impacts of Climate Change on the Atmosphere
- Project Lead The Way
  - Let's Make Ice Cream
  - Let's Make Yogurt
  - Gluing it Together
  - Oil Spill Clean Up

Assessments

Formative:

- Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- C-E-R exit slips

Summative:

- 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.
- Undertake a design project to construct, test and modify a device that either releases or absorbs thermal energy by chemical processes.
- Project Lead the Way - Let's Make Ice Cream
- Project Lead the Way - Oil Spill Clean Up

Benchmark: N/A

Alternative:

- "The Right Stuff" Manufacturing Challenge

- Compound Illustrations; Chemical Changes Song

Interdisciplinary Connections

New Jersey Student Learning Standards

ELA:

L.VL.8.3. Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, including technical meanings, choosing flexibly from a range of strategies.

- **A**. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
- **C.** Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word

RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) to strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

RI.IT.8.3. Analyze how particular elements of a text interact (e.g., how contexts influence individuals or events, or how individuals influence ideas or events) across multiple text types, including across literary and informational texts.

W.AW.8.1. Write arguments on discipline- specific content (e.g. social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

- **A.** Introduce claim(s) about a topic or issue, acknowledge and distinguish alternate opposing claims, and organize the reasons and evidence logically.
- **B.** Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

RI.CT.8.8. Analyze and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) two or more informational texts that provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.

W.SE.8.6 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

SL.II.8.2. Analyze the purpose of information presented in diverse media formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

Mathematics:

6.G.A.4 Represent three-dimensional figures (e.g., pyramid, triangular prism, rectangular prism) using nets made up of rectangles and triangles, and use the nets to find the surface

area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change,and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
9.1.5.TL.2 Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).

Technology Integration

8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.
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).

Career Education

CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11. Use technology to enhance productivity.

Modifications (ELL, Special Education, At Risk Students, Gifted & Talented, & 504 Plans)

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments

- Provide students with English Learner leveled readers.

Supports for Students With IEPs:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

At-Risk Students:

- Guided notes and/or scaffold outline for written assignments
- Introduce key vocabulary before lesson
- Work in a small group
- Lesson taught again using a differentiated approach
- Allow answers to be given orally or dictated
- Use visuals / Anchor Charts
- Leveled texts according to ability

Gifted and Talented:

- Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles)
- Provide options, alternatives and choices to differentiate and broaden the curriculum
- Organize and offer flexible small group learning activities
- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use center, stations, or contracts
- Organize integrated problem-solving simulations
- Propose interest-based extension activities
- Expose students to beyond level texts.

Supports for Students With 504 Plans:

- Follow all the 504 plan modifications
- Text to speech/audio recorded selections
- Amplification system as needed
- Leveled texts according to ability
- Fine motor skill stations embedded in rotation as needed

DEPARTMENT: **Science** COURSE: **Science, Grade 8**

- Modified or constrained spelling word lists
- Provide anchor charts with high frequency words and phonemic patterns