Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

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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

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Week	Marking Period 1	Week	Marking Period 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	Marking Period 2	**Week**	Marking Period 4
11	Physical Science: Energy Transfer	31	Chemical Reactions: Project

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			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
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

Core Instructional & Supplemental Materials including various levels of Texts

Texts:
No Text Used/All digital resources
Digital Resources Across All Levels: (D=differentiated)
Edpuzzle (D)
Gizmo (D)
Science World Articles
YouTube Streaming Videos
PhET Interactive Simulations (D)
Ted Talks

Time Frame	**2 Weeks**

Topic

Science Practices: Understand Science Explanations, Generate Scientific Evidence through

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Active Investigation, Reflect on Scientific Knowledge, Participate Productively in Science

Science Practices: **Students can articulate the importance of accurate data collection and record keeping in science, and are able to demonstrate good practices for data collection, and identify common sources of error.**

Essential Questions

- How do we build and refine models that describe and explain the natural and designed world?
- What constitutes useful scientific evidence?
- How is scientific knowledge constructed?
- How does scientific knowledge benefit, deepen, and broaden from scientists sharing and debating ideas and information with peers

Enduring Understandings

- 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.
- Scientific knowledge builds upon itself over time.
- The growth of scientific knowledge involves critique and communication – social practices that are governed by a core set of values and norms.

Alignment to Standards

MS-ESS2-3, MS-ESS1-4, MS-ESS2-2, MS-ESS2-3, MS-PS1-5, MS-PS1-2, MS-PS1-6, MS-PS1-5, MS-PS1-2

Key Practices and Skills

- Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.
- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim.
- Construct and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.
- Analyze and interpret data to provide evidence for phenomena.

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- 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.
- Analyze and interpret data to determine similarities and differences in findings.
- Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.
- Results of observation and measurement can be used to build conceptual-based models and to search for core explanation.
- Evidence is generated and evaluated as part of building and refining models and explanations.
- Mathematics and technology are used to gather, analyze, and communicate results.
- Carefully collected evidence is used to construct and defend arguments. Scientific reasoning is used to support scientific conclusions.
- Scientific models and understandings of fundamental concepts and principles are refined as new evidence is considered.
- Science involves practicing productive social interactions with peers, such as partner talk, whole group discussions, and small-group work.
- In order to determine which arguments and explanations are most persuasive, communities of learners work collaboratively to pose, refine, and evaluate questions, investigations, models and theories.
- Instruments of measurement can be used to safely gather accurate information for making scientific investigations and model-building

Learning Activities

- Lab Safety Activity
- Pendulum lab
- Claim Evidence Reasoning Introductory Activity
- Claim Evidence Reasoning Checks Lab
- Reading and Creating graphs
- Engaging in arguments from evidence – Escape Room
- Planning and carrying out investigations - Toxic Popcorn Challenge

- Developing and refining models
  - Sink or Float Challenge
  - Google Mini Project
- Generate, discuss, analyze and interpret data
- Reading the Meniscus Station Lab Activity
- Metric Measurement Lab
- Engage in both spoken and written explanations and argumentation

Assessments

Formative:

Lab Safety Quiz
Reading the Meniscus Station Lab Activity
Claim, Evidence, Reasoning Poster
Metric Conversion Quiz

Summative:

Benchmark:

Science reasoning skills (interpreting graphics)

Alternative:

Google Mini 3D printed Model and Advertisement

Career Education

CRP-2 – Students use knowledge and skills through their lab work.
CRP-12 – Students work productively in collaborative groups using culturally global competence.
CRP11-Use technology to enhance productivity.

21st Century Skills

Compare/contrast and interpret graphic data in order to make claims based on evidence.
3-D wall mount for google home device/cell phone
Build virtual cars
9.3.ST.2 Use technology to acquire, manipulate, analyze and report data

Interdisciplinary Connections

Mathematics:

- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities
- Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line

diagrams, or equations

- Recognize and represent proportional relationships between quantities.
- Reason abstractly and quantitatively.

MP.4 Model with mathematics.

8.EE.A.3-Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

8.EE.A.4-Recognize and represent proportional relationships between quantities.

ELA/Literacy:

- Cite specific textual evidence to support analysis of science and technical text
- Draw evidence from informational texts to support analysis reflection, and research.
- Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Technology Integration

- Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest
- Use of mobile media devices as tools for data collection, as well as online data sets
- Digital production tools (digital photography and video)
- Graphics software (drawing, painting, image editing)

Multimedia resources (images, video, audio, animations, simulations, and educational games)

- Tinker Cad
- Google Suite
- Smart Board Activities

8.1.8-- Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

Time Frame	**21 Weeks**

Topic

Physical Science: Forces and Interactions, Energy, Waves and Electromagnetic Radiation
Physical Science: Engineering-Design Project.
Physical Science: 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.

Essential Questions

- How do we know that things have energy?
- How can energy be transformed from one material to another?
- What happens to a material when energy is transferred to it?
- How can energy be transferred from one material to another?
- What happens to a material when energy is transferred to it?

Enduring Understandings

- 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.
- Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.
- A system of objects may also contain stored (potential) energy, depending on their relative positions.
- When the motion energy of an object changes, there is inevitably some other change in

energy at the same time.

- When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.
- When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light.
- The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends.
- A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media.

Alignment to Standards

MS-PS2- 1, MS-PS2- 2, MS-PS2-3, MS-PS2- 4, MS-PS2-5, MS-PS3- 1, MS-PS3- 2, MS-PS3- 3, MS-PS3- 4, MS-PS3-5, MS-PS4- 1, MS-PS4- 2, MS-PS4- 3

Key Practices and Skills

- Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects
- Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object
- 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.
- 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
- 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.
- Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer

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
    - Rollback Toy- Elastic Potential Energy
    - Green Car Lab
    - Rube Goldberg Activity
    - Dragster Lab

Assessments

Formative:
Lab Conclusions
Energy Photogate Lab Data including line graph
Friction Lab – Bar Graph
Kinetic/Potential Energy Formula Quiz
Heat Transfer Station Lab Quiz
Forces Quiz

Summative:
Chapter Test (Energy & Motion/Forces), Rollercoaster Challenge

Benchmark:

Alternative:
Project Lead The Way- Rollback Toy Final Product, Green Car Final Product, Rube Goldberg Video and labels of final product.

Career Education

CRP-2 – Students use knowledge and skills through their lab work.
CRP-12 – Students work productively in collaborative groups using culturally global competence.
CRP4- Communicate clearly and effectively and with reason.

21st Century Skills

Design and create a working roller coaster.
Designing parachutes for various free-falling weights.
Crash scene investigation.
9.3.ST-ET.5 Apply the knowledge learned in STEM to solve problems.

Interdisciplinary Connections

ELA/Literacy:

- Cite specific textual evidence to support analysis of science and technical text
- Draw evidence from informational texts to support analysis reflection, and research.
- Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.

Mathematics:

- Engineering/Math: Rollercoaster Challenge
- Math: Multiple Labs (Speed & Momentum)
- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities
- Use ratio and rate reasoning to solve real-world and mathematical problems.
- Recognize and represent proportional relationships between quantities.
- Reason abstractly and quantitatively.

MP.4 Model with mathematics.

8.EE.A.3- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

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8.EE.A.4- Recognize and represent proportional relationships between quantities.

Technology Integration

- Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest
- Digital production tools (digital photography and video)
- Graphics software (drawing, painting, image editing)

Multimedia resources (images, video, audio, animations, simulations, and educational games)

TECH.8.1.8.E - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.8.A- Demonstrate knowledge of a real world problem using digital tools.

Time Frame	**7 Weeks**

Topic

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

Essential Questions

- How do the properties of materials determine their use?
- How does the conservation of mass apply to their interaction of materials in a closed system?

Enduring Understandings

- 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.
- Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.
- 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, they 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.
- Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).

- 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.
- The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time.
- Engineering advances have led to important discoveries in virtually every field of science and scientific discoveries have led to the development of entire industries and engineered systems.
- The Periodic Table organizes elements into families of elements with similar properties.
- Elements are a class of substances that are composed of a single kind of atom. Compounds are substances that are chemically formed and have physical and chemical properties that differ from the reacting substances.
- Substances such as metals, non-metals, acids and bases are classified according to their physical and chemical properties.

Alignment to Standards

MS-PS1-1,
MS-PS1-3,
MS-PS1-4

Key Practices and Skills

- 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.

- 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.

Learning Activities

- Molecules in Motion
- States of Matter Basics
- Build-a-Molecule
- Changes of State
- Changing State - Evaporation
- Topic Activities
    - "Properties of Matter – White Before Your Eyes" Lab
    - "Compounds vs. Mixtures"
    - "Classifying Matter"
    - "Phases of Matter Cartoon"
    - "Arranging the Elements"
    - "A World Famous Table"
- Project / Performance Assessments – "Elemental Superhero" (moved to assessment)
- Project Lead The Way: The Science of Technology
    - Nanotechnology – Fact or Myth?
    - How Small is a Billionth?
    - Build a Bucky-ball
    - Exploring Nano Products
    - Testing Nano-fabrics

Assessments

Formative:

White Before Your Eyes – Data Table/ Analysis Questions
Element Research Project
Mixture Quiz
Atoms Quiz

Summative:

Chemistry Test

Benchmark:

Alternative:

Project Lead The Way- Build a Buckyball final product

Career Education

CRP-2 – Students use knowledge and skills through their lab work.
CRP-12 – Students work productively in collaborative groups using culturally global competence.

21st Century Skills

Design and construct materials to test the melting rates of ice/Apply results to home environment, i.e. defrosters, cooking, rock salt for walkways, etc.

9.3.ST-SM.2 Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.

Interdisciplinary Connections

ELA/Literacy:

- Open-Ended and Real World Application Questions, Short Story about Changes in State.
- Cite specific textual evidence to support analysis of science and technical texts.
- Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table)

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.

Mathematics:

Computation for Finding the Number of Subatomic Particles.

- Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

- Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations
- Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
- Reason abstractly and quantitatively

MP.4 Model with mathematics.

8.EE.A.3- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

8.EE.A.4- Recognize and represent proportional relationships between quantities

Technology Integration

- Print 3-D molecules
- Use of mobile media devices as tools for data collection, as well as online data sets
- Computer-aided design, modeling software, and simulation software
- Digital production tools (digital photography and video)
- Graphics software (drawing, painting, image editing)

Multimedia resources (images, video, audio, animations, simulations, and educational games)

TECH.8.1.8.E - Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.8.A- Demonstrate knowledge of a real world problem using digital tools.

Time Frame	**9 Weeks**

Topic

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

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Essential Questions

- How does the conservation of mass apply to the interaction of materials in a closed system?
- How do properties of materials determine their use?

Enduring Understandings

- 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.
- The total number of each type of atom is conserved, and thus the mass does not change.
- Some chemical reactions release energy, others store energy.
- A solution needs to be tested, and then modified on the basis of the test results in order to improve it.
- 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 - that is, some of the characteristics may be incorporated into the new design.
- 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.
- When materials interact within a closed system, the total mass of the system remains the same.
- Substances can undergo physical and chemical changes to form new substances.
- Each change involves energy.

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Alignment to Standards
MS-PS1-2, MS-PS1-5, MS-PS1-6
Key Practices and Skills
• Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. • 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. • When substances undergo chemical change, the number and kinds of atoms in the reactants are the same as the number and kinds of atoms in the products. • The mass of the reactants is the same as the mass of the products. • Chemical changes can occur when two substances, elements, or compounds react and produce one or more different substances. • The physical and chemical properties of the products are different from those of the reacting substances.

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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
• Isn't it Ionic?
• Bonding with a Buddy
• Balancing Chemical Equations
• Periodic Table Color Coding
• Generate, discuss, and analyze data
• Engage in both spoken and written explanations and argumentation
• Project Lead The Way
  ○ Let's Make Ice Cream
  ○ Let's Make Yogurt
  ○ Gluing it Together
  ○ Oil Spill Clean Up

Assessments

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Formative:
Physical and Chemical Changes Quiz
Balancing Chemical Equations Quiz
Summative:
Chemistry Periodic Table Test
Benchmark:
Alternative:
Project--"Building Atomic Models"
Project Lead the Way- Let's Make Ice Cream – Analysis questions
Project Lead the Way- Oil Spill Clean Up- Conclusion
Gizmos Lab – pH analysis
Gizmos Lab – Changes is States of Matter
"The Right Stuff" Manufacturing Challenge
Compound Illustrations; Chemical Changes Song

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Career Education
CRP-2 – Students use knowledge and skills through their lab work. CRP-12 – Students work productively in collaborative groups using culturally global competence. CRP11- Use technology to enhance productivity.
21st Century Skills
Create variations of ice cream Chemistry of Oil Spill Clean-Up 9.3.ST-SM.2 Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems. 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data
Interdisciplinary Connections
ELA/Literacy: Journal Entries, Open-Ended and Real World Application Questions, ○ Cite specific textual evidence to support analysis of science and technical texts. ○ Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. ○ Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). ○ Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.

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Mathematics:

Balancing equations, massing products and reactants, converting metric units

- Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
- Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- Summarize numerical data sets in relation to their context.
- Reason abstractly and quantitatively.
- Model with mathematics.

MP.4 Model with mathematics.

8.EE.A.3- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

8.EE.A.4- Recognize and represent proportional relationships between quantities.

Technology Integration

Use center, stations, or contracts

- Organize integrated problem-solving simulations
- Propose interest-based extension activities

TECH.8.1.8.A- Demonstrate knowledge of a real world problem using digital tools.

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

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- 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:

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