Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

SPARTAN MISSION:
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DEPARTMENT : Science COURSE : Grade 5

Curriculum Development Timeline

School: Township of Ocean Elementary Schools

Course: Science, Grade 5

Department: Science

Board Approval	Supervisor	Notes
February 2009	Jessica Shaw	Born Date
June 2011	Christine Picerno	Revisions
August 2017	Christine Picerno	Revisions
March 2019	Christine Picerno	Review
August 2021	Rich Steckhahn	Alignment to Standards & Revisions
August 2022	Patrick Sullivan	Incorporate State Mandate

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DEPARTMENT : Science

COURSE : Grade 5

Township of Ocean Pacing Guide			
Week	Marking Period 1	**Week**	Marking Period 3
1	Physical Science Structures and Properties of Matter	21	Earth Science - Earth's Systems
2	Physical Science Structures and Properties of Matter	22	Earth Science - Earth's Systems
3	Physical Science Structures and Properties of Matter	23	Earth Science - Earth's Systems
4	Physical Science Structures and Properties of Matter	24	Earth Science - Earth's Systems
5	Physical Science Structures and Properties of Matter	25	Earth Science - Earth's Systems
6	Physical Science Structures and Properties of Matter	26	Earth Science - Earth's Systems
7	Physical Science Structures and Properties of Matter	27	Earth Science - Earth's Systems
8	Physical Science Structures and Properties of Matter	28	Earth Science - Earth's Systems
9	Physical Science Structures and Properties of Matter	29	Physical Science -Space Systems: Stars and the Solar System
10	Physical Science Structures and Properties of Matter	30	Physical Science -Space Systems: Stars and the Solar System
Week	Marking Period 2	**Week**	Marking Period 4
11	Life Science - Matter and Energy in Organisms and Ecosystems	31	Physical Science -Space Systems: Stars and the Solar System
12	Life Science - Matter and Energy in Organisms and Ecosystems	32	Physical Science - Space Systems: Stars and the Solar System
13	Life Science - Matter and Energy in Organisms and Ecosystems	33	Physical Science - Space Systems: Stars and the Solar System
14	Life Science - Matter and Energy in Organisms and Ecosystems	34	Physical Science - Space Systems: Stars and the Solar System
15	Life Science - Matter and Energy in Organisms and Ecosystems	35	Physical Science - Space Systems: Stars and the Solar System
16	Life Science - Matter and Energy in Organisms and Ecosystems	36	Physical Science - Space Systems: Stars and the Solar System
17	Life Science - Matter and Energy in Organisms and Ecosystems	37	Physical Science - Space Systems: Stars and the Solar System
18	Life Science - Matter and Energy in Organisms and Ecosystems	38	Physical Science - Space Systems: Stars and the Solar System
19	Life Science - Matter and Energy in Organisms and Ecosystems	39	Physical Science - Space Systems: Stars and the Solar System

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20	Life Science - Matter and Energy in Organisms and Ecosystems	40	Physical Science - Space Systems: Stars and the Solar System

Climate Change: Earth's Systems (NJSLS-S: 5-ESS3-1)

Core Instructional & Supplemental Materials including various levels of Texts
Mystery Science Lessons, Generation Genius, Wonders Reading Program, Brain Pop, Pebble Go, PBS Kids, Interactive Games/Demonstrations, DBQ Projects, and various trade books related to unit topics.

Time Frame	12 weeks

Topic

Space Systems: Stars and the Solar System

Alignment to Standards

5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down. *[Clarification Statement: "Down" is a local description of the direction that points toward the center of the spherical Earth.] [Assessment Boundary: Assessment does not include mathematical representation of gravitational force.]*

5-ESS1-1 Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. *[Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).]*

5-ESS1-2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. *[Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [Assessment Boundary: Assessment does not include causes of seasons.]*

Learning Objectives and Activities

Students will understand that…….

- Stars range greatly in size and distance from Earth, and this can explain their relative brightness.

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- The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.
- The length of each day and the direction of shadows are affected by the orbit of both the Earth and the Moon.
- Patterns can be seen in the Earth's orbit around the sun and the moon's orbit around the Earth. These patterns include day and night.

Activities

Mystery Science
- Spaceship Earth

Generation Genius
- Balanced & Unbalanced Forces
- Conservation of Matter
- Earth's Orbit and Rotation
- Sun and Other Stars
- Water Cycle (3-5 Version)
- Water Quality & Distribution

Textbook Readings
- Close Read D 32-33 (rotation/seasons)
- D 38-39 (day & night varies)
- D 74-75 (sun)
- Study Guide B Workbook pg 28 (seasons)

Interactive Lesson Plans
- Explaining why Sun's shadows change throughout the day "Connecting Shadows with the Sun's altitude"
- Egg Drop Engineering Part 1 , Part 2 (couple days), Part 3, Part 4 (includes a rubric)
- PBS Gravity and Falling Objects (approx 2 day lesson & investigation)

enVision Math and Science Connections
- Earth's Rotation Topic 14 pg 773
- Solar Energy Topic 4 pg 163

Wonders
- Leveled Reader: Stargazing

Brain Pop
- Seasons

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- Sun
- Gravity

Additional Reading Materials

- ReadWorks online article The Sun Heats Up and printable worksheet
- ReadWorks online article The appearance of Stars
- The Sun leveled reader resources

Online Videos

- CrashCourse kids video (Earth's rotation and revolution)
- CrashCourse kids Sun and the Seasons
- Crash Course Kids Following the Sun (shadows)
- Crash Course Kids Gravity
- What are Stars? (short video)

Additional Resources/Games

- Soft Schools Gravity reading and questions
- Brain Pop Gravity simulation
- Gravity worksheet gravity
- Gravity and Orbits simulation
- Seasonal Appearance of the Stars Prezi (short prezi describing how stars look different in each season)
- Gravity powerpoint

Assessments

Formative Assessments

- Brainpop Sun quiz
- Brain Pop Gravity Quiz and worksheet
- Brainpop Seasons worksheet
- Formative Monitoring (Questioning / Discussion)
- Student Lab Sheets from BetterLesson

Summative Assessments

- Mystery Science: Earth's Rotation Assessment (Answer key)
- Mystery Science: Sun's Path Assessment (answer key)
- End of Unit assessment NGSS resources

Alternative Assessments

- EnVisions - Math/Science Connections
    1. Earth's Rotation Topic 14(pg 773)
    2. Solar Energy Topic 4 (pg 163)

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DEPARTMENT : Science COURSE : Grade 5

Interdisciplinary Connections

NJSLS: ELA

- **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-PS2-1), (5-ESS1-1)
- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS1-1)
- **RI.5.8** Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). (5-ESS1-1)
- **RI.5.9** Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-PS2-1), (5-ESS1-1)
- **W.5.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5- PS2-1), (5- ESS1-1)
- **SL.5.5** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-ESS1-2)

NJSLS: Mathematics

- **MP.2** Reason abstractly and quantitatively. (5-ESS1-1),(5-ESS1-2)
- **MP.4** Model with mathematics. (5-ESS1-1),(5-ESS1-2)
- **5.NBT.A.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-ESS1-1)
- **5.G.A.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS1-2)

NJSLS: Computer Science and Design Thinking

- **8.1.5.IC.1:** Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
- **8.1.5.IC.2:** Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- **8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Career Readiness, Life Literacies, and Key Skills

- **9.2.5.CAP.4:** Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.

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Technology Integration

- **9.4.5.CI.3:** Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity.
- **9.4.5.IML.3:** Represent the same data in multiple visual formats in order to tell a story about the data.

Career Education

CRP 8. SW utilize critical thinking to make sense of problems and persevere in solving them by completing the Mystery Science challenge.
CRP 11. SW use technology to enhance productivity by accessing the following online resources:

- Amazing Water & Sound Experiment
- Sound
- BrainPop Waves
- BrainPop Light
- Brainpop: Sound
- Waves
- Dolphin Sound Echoes

Time Frame	8 weeks

Topic

Earth Systems

Alignment to Standards

5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. *[Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]*

5-ESS2-2 Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. *[Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.].*

5-ESS3-1 Obtain and combine information about ways individual communities use science

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ideas to protect the Earth's resources, environment, and address climate change issues.

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Learning Objectives and Activities

Students will understand that……

- Some events happen very quickly; others occur very slowly over time.
- Most of Earth's water is in the ocean and much of the Earth's freshwater is in glaciers or underground.
- The Earth's systems are the geosphere (solid and molten rock, soils, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans).
- The Earth's systems interact in a variety of ways that affect earth's surface materials and processes.
- The ocean supports a variety of ecosystems and organisms, shapes landforms and influences climate.
- The atmosphere affects landforms and ecosystems through weather and climate.
- Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.
- Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space.
- Humans and other organisms will be affected in many different ways if Earth's global mean temperature continues to rise.

Activities

Mystery Science

- Watery Planet

Generation Genius

- Balanced & Unbalanced Forces
- Conservation of Matter
- Earth's Orbit and Rotation
- Sun and Other Stars
- Water Cycle (3-5 Version)
- Water Quality & Distribution

Subject To Climate Resource

DBQ

- Volume 1 - Unit VIII: Why are Hurricanes So Dangerous?
- Volume 1 - Unit X: Should Your Town Ban Sale of Plastic Water Bottles?

Textbook Reading

- Characteristics of Earth's Spheres *(print & distribute for close read)*
- Atmosphere and Climate leveled reader *(printable -with a quiz)*
- Earth's Systems and Interactions *(pg 1 & 2 only)*
- The Hydrosphere *(library book)*

Presentations

- Earth the Watery Planet
- Earth's Waters *(prezi)*

Additional Lesson Plans

- An entire Water System Unit for 5th grade/aligned to standards
- NASA Earth's Systems Unit (teacher's guide)
- NASA Our Earth: A Web of Systems
- The Earth's Systems Great lesson for modeling how -spheres interact
- Hydrosphere: Water Distribution on Earth. Works for graphing amounts of water
- PBS: Water *(quick video with good conversation starters to open the topic)*
- Journey Through the Universe: Earth Systems, Water Resources 5 day unit with graphs and project based assessment
- National Weather Service: Water Cycle Paper Craft
- National Weather Service: The Rain Man demonstrate concept of precipitation
- National Weather Service: What-a-cycle
- National Weather Service: Water, Water Everywhere student use graduated cylinders to display amounts of water in the world.
- NASA Water cycle webquest with videos & articles embedded
- NASA additional resources for weather & climate, air, ocean, and freshwater (all

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separate links)
- Cycles of Earth's Systems
- Earth's Systems and their interactions

Virtual Labs & Games
- Protect the Earth Webquest on using science ideas to protect Earth
- The Interaction of Earth's Spheres
- NASA Climate Time Machine & Game
- NASA Climate Trivia
- Freshwater Quiz by National Geographic
- Virtual Lab on Assessing Water Quality
- Water Quality Game
- Virtual Water Conservation Activity
- Glacier Interactive Simulation

Videos
- Bozeman Science: Earth's Materials and Systems
- Bozeman Science: Role of Water
- Bozeman Science: Human Impact on Earth's Systems
- Crash Course Kids: Four Spheres Part 1 (Geosphere and Biosphere)
- Crash Course Kids: Four Spheres Part 2 (Hydrosphere and Atmosphere)
- Crash Course Kids: What on Earth? (Interaction of Spheres)
- Crash Course Kids: H2O- No! Fresh Water Problems
- Bill Nye The Science Guy on Wind
- Bill Nye The Science Guy on the Atmosphere
- BrainPop- Entire Earth's Systems collection
- Youtube 4 Sphere Song

EnVision Math and Science Connections
- Topic 3: **Water Usage**
- Topic 6**: States of Water**

STEAM
- Oil Spill Engineering

Wonders Reading
- "Shelter in a Storm" ***Unit 1 Week 2***
- "Changing Climate, Changing Lives" ***Unit 5 Week 3***
- "Dams:Harnessing the Power of Water" ***Unit 5 Week 5***
- "Science Makes a Difference!" ***Unit 6 Week 4***

Additional Reading

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- Readworks: Water, Water Everywhere *(with vocabulary and assessment)*
- The Hidden Water We Use by National Geographic
- A Freshwater Story *(interactive)* by National Geographic

Extension Activity Unit

- NASA on Climate Science (can use part or whole unit; final project on grant writing on page 49-55)

Assessments

Formative Assessments

- Formative Monitoring (Questioning / Discussion)
- Student Lab Sheets from lessons

Summative Assessments

- Earth's Spheres Formal Assessment

Alternative Assessments

- Poster of Earth's Spheres done electronically or on paper
- NASA on Climate Science (can use part or whole unit; final project on grant writing on page 49-55)
- EnVisions - Math and Science Connections
  - Topic 3: **Water Usage**
  - Topic 6**:** **States of Water**

Interdisciplinary Connections

NJSLS: ELA

- **RI.5.1** Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS3-1), (3-5-ETS1-2)
- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS2-1), (5-ESS2-2), (5-ESS3-1), (3-5-ETS1-2)
- **RI.5.9** Integrate and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS3-1), (3-5-ETS1-2)
- **W.5.7** Conduct short research projects that use several sources to build knowledge through investigation of different perspectives of a topic. (3-5-ETS1-1), (3-5-ETS1-3)
- **W.5.8** Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished

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work, and provide a list of sources. (5-ESS2-2), (5-ESS3-1), (3-5-ETS1-1), (3-5-ETS1-3)
- **W.5.9** Draw evidence from literary or informational texts to support analysis, reflection, and research. (5- ESS3-1), (3-5-ETS1-1), (3-5-ETS1-3)
- **SL.5.5** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-ESS2-1), (5-ESS2-2)

NJSLS: Mathematics
- **MP.2** Reason abstractly and quantitatively. (5-ESS2-1), (5-ESS2-2), (5-ESS3-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- **MP.4** Model with mathematics. (5-ESS2-1), (5-ESS2-2), (5-ESS3-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- **MP.5** Use appropriate tools strategically. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- **5.G.A.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS2-1)
- **3-5.OA** Operations and Algebraic Thinking (3-5-ETS1-1), (3-5-ETS1-2)

NJSLS: Computer Science and Design Thinking
- **8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.
- **8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Career Readiness, Life Literacies, and Key Skills

- **9.2.5.CAP.4:** Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.

Technology Integration

- **9.4.5.CI.1:** Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions.
- **9.4.5.CI.2:** Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue.
- **9.4.5.CT.2:** Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem.
- **9.4.5.CT.4:** Apply critical thinking and problem-solving strategies to different types of

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problems such as personal, academic, community and global.

- **9.4.5.DC.8:** Propose ways local and global communities can engage digitally to participate in and promote climate action.

Career Education

CRP 8. SW utilize critical thinking to make sense of problems and persevere in solving them by completing the Mystery Science challenge.
CRP 11. SW use technology to enhance productivity by accessing the following online resources:

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- Sound
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- BrainPop Light
- Brainpop: Sound
- Waves
- Dolphin Sound Echoes
- Bill Nye the Science Guy on Light

Time Frame	10 weeks

Topic

Matter and Energy in Organisms and Ecosystems

Alignment to Standards

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water. *[Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]*

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. *[Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]*

5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. *[Clarification Statement: Examples of models could include diagrams, and flow charts.].*

Learning Objectives and Activities

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Students will understand that…

- Food provides animals with the materials and energy they need for body repair, growth, warmth and motion. Plants acquire material for growth chiefly from air, water, and process matter and obtain energy from sunlight, which is used to maintain conditions necessary for survival.
- The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.
- Matter cycles between the air and soil and among organisms as they live and die. Energy can be "produced," "used," or "released" by converting stored energy. Plants capture energy from sunlight, which can later be used as fuel or food.
- The energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter.
- A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.
- Matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food.

Activities

Mystery Science Lessons
- Web of Life

Generation Genius
- Food Webs
- How Do We Use Food

Textbook Readings
- A 50-54 (photosynthesis)
- B 24-25 (food webs)
- B 26-28 (food chains)
- Worksheets to support: A24-25 & B13 (food chains & webs)
- B 46-49 (balanced ecosystems)

Interactive Lessons
- Better Lesson (interactive) Do plants need soil? *(about 2 days)*
- Better Lessons Interactive activities: Movement of Matter in Ecosystems (part1) Movement of Matter in Ecosystems (part 2)
- Activity: Plants in Space *(will take 2 days plus observation (few weeks)*

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- Dramatic Food Chain lesson (Dramatic Food Chain)
- Photosynthesis lesson & activity
- Food web game (how changes affect organisms)
- How Do Animals obtain Energy?
- Energy flow through a Food Web lesson plan

enVision Math and Science Connections

- Ecosystems Topic 16 pg 845
- Food chains & Food webs Topic 13 pg731

Brain Pop

- Photosynthesis: Brain Pop
- Brain Pop Food Chains
- Energy Pyramid

Online Videos

- Photosynthesis Intro Video
- Plants:Who Needs Dirt? ? intro video
- Bill Nye (food chains):
- Crash Course Kids Food Chains
- Crash Course Kids Food Webs
- Energy Flow in an Ecosystem
- LS1C - Matter and Energy Flow in Organisms

Additional Resources

- Kahoot (food chains/webs)
- game Feed The Dingo Game (balanced ecosystem)
- Study Jams (http://studyjams.scholastic.com/studyjams/)
- Ecosystems game: Ecosystems
- Energy Pyramid worksheet (using our environment to complete)
- Photosynthesis worksheet
- Study Jams food webs
- Study Jams Food chains
- ReadWorks Ecosystem in a Forest (how each organism is a necessary part)
- Food Web Worksheet

Assessments

Formative Assessments

- Schoology Food Chains & Food Web Quiz
- Energy Quiz *(food webs/chains)*
- Brain Pop Food Chains Printable Quiz

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- Energy pyramid printable quiz
- Food Chain printable quiz
- Formative Monitoring (Questioning / Discussion)

Summative Assessments

- Follow Up Questions: Feed the Dingo
- End of Unit Assessment Web of LIfe
- Student Lab Sheets from Better Lessons/Mystery Science lessons

Alternative Assessments

- EnVisions Math/Science Connections
  - Ecosystems Topic 16 pg 845
  - Food chains & Food webs Topic 13 pg731

Interdisciplinary Connections

NJSLS: **ELA**

- **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-LS1-1)
- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2-1), (5-PS3-1)
- **RI.5.9** Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-LS1-1)
- **W.5.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5- LS1-1)
- **SL.5.5** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-LS2-1), (5-PS3-1)

NJSLS: Mathematics

- **MP.2** Reason abstractly and quantitatively. (5-LS1-1), (5-LS2-1)
- **MP.4** Model with mathematics. (5-LS1-1), (5-LS2-1)
- **MP.5** Use appropriate tools strategically. (5-LS1-1)
- **5.MD.A.1** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. (5-LS1- 1)

NJSLS: Computer Science and Design Thinking

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- **8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.
- **8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Career Readiness, Life Literacies, and Key Skills

Technology Integration

- **9.4.5.CT.1:** Identify and gather relevant data that will aid in the problem-solving process.
- **9.4.5.CT.4:** Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
- **9.4.5.IML.2:** Create a visual representation to organize information about a problem or issue.

Career Education

CRP 8. SW utilize critical thinking to make sense of problems and persevere in solving them by completing the Mystery Science challenge.
CRP 11. SW use technology to enhance productivity by accessing the following online resources:

- Amazing Water & Sound Experiment
- Sound
- BrainPop Waves
- BrainPop Light
- Brainpop: Sound
- Waves
- Dolphin Sound Echoes
- Bill Nye the Science Guy on Light

Time Frame	10 weeks

Topic

Structures and Property of Matter

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Alignment to Standards

5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen. *[Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]*

5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. *[Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.] [Assessment Boundary: Assessment does not include distinguishing mass and weight.]*

5-PS1-3 Make observations and measurements to identify materials based on their properties. *[Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.]*

5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Learning Objectives and Activities

Students will understand that…

- Since matter exists as particles that are too small to see, matter is always conserved even if it seems to disappear. Measurements of a variety of observable properties can be used to identify particular materials.
- Chemical reactions occur when substances are mixed together and a new substance is formed. The properties of a chemical reaction will be different, but the total mass remains the same.
- Examples of observable properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response.

Activities

Mystery Science

- Chemical Magic

Generation Genius

- Particle Nature of Matter
- Properties of Matter
- Chemical vs. Physical Changes

Home of the Spartans!
#spartanlegacy

Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

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Wonders Reading

- "Minerals" Unit 4 Week 4

Houghton Mifflin Science: Unit E

- ***Chapter 12-The Structure of Matter***
  - Lesson 1-What Are Elements?
  - Lesson 3-What Are Compounds?
- ***Chapter 13-Characteristics of Matter***
  - Lesson 1- How Can Materials Be Identified?
  - Lesson 2-How Does Matter Change?
  - Lesson 3-What are Solutions and Mixtures?
  - Why Does Matter Matter? Close Read with Assessment

Additional Lesson Plans

- Prezi: Science Structures and Properties of Matter
- Dissolving Salt lab: dissolving DOES NOT create something new
- Using a triple beam balance to test if matter changes weight after melting and freezing
- Investigating changes of state with ice cubes
- Students make glue balls, lava lamps, origami dogs, and many more exciting things to help them differentiate between physical and chemical changes.
- Structure and Properties of Matter Lesson Plans
- Bubble Bomb- baking soda, vinegar, plastic bag reaction

Virtual Labs & Games

- ENGAGE: Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions Share internet website "Strange Matter"
- This site has the embedded States of Matter Video, Matter Sorter Game, Group Classroom Lesson and Review Quiz. Also, students will use the Cause and Effect Graphic Organizer as a recording device for the States of Matter.
- Virtual Phases of Matter Gizmo with vocabulary and student exploration sheet
- Virtual Lab on Properties of Materials
- Virtual lab on physical and chemical changes
- Virtual Lab on Mystery Powder Analysis with vocabulary and student exploration sheet
- Virtual Lab on Mineral Identification using physical properties with vocabulary and student exploration sheet

Videos

- BrainPop- States of Matter
- BrainPop-Matter Changing States

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- Bill Nye-3 Phases of Matter
- Matter Compilation: Crash Course Kids
- Chemical Changes: Crash Course Kids
- Oobleck and Non-Newtonian Fluids: Crash Course Kids
  (to be used in conjunction with mystery science 3)
- Bozeman Science: Structure and Properties of Matter
- Study Jams: Matter

EnVision Math and Science Connections

- Topic 6: States of Water
- Topic 8: Kitchen Chemistry

STEAM

- Engineering Activity using hot air balloons: How heat can change air?

Additional Reading

- Readworks (with vocabulary and questions) Matter Is Everywhere
- Chemistry for Kids
- Why is the Statue of Liberty Green?
- Matter
- Adventure on Hot Air Balloons
- Bartholomew and the Oobleck by Dr. Seuss
  (in conjunction with Mystery Science 3)

Assessments

Formative Assessments

- Student Lab Sheets from Better Lesson
- States of Matter formal quiz after Close Read
- Formative Monitoring (Questioning / Discussion)

Summative Assessments

- Mystery Science Assessment pages for Matter
- Houghton Mifflin Science Assessments for chapters 12 and 13 *(see Zen Room)*
- Phases of Matter formal assessment with answer key
- Optional Unit Assessments from Better Lesson

Alternative Assessments

- Engineering Activity using hot air balloons: How heat can change air?
- EnVisions - Math and Science Connection
  - Topic 6: States of Water
  - Topic 8: Kitchen Chemistry

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Interdisciplinary Connections

NJSLS: ELA

- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS1-1)
- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS1-1)
- **W.5.7** Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (5-PS1-2), (5-PS1-3), (5-PS1-4)
- **W.5.8** Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-PS1-2), (5- PS1-3), (5-PS1-4)
- **W.5.9** Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-PS1-2), (5- PS1-3), (5-PS1-4)

NJSLS: Mathematics

- **MP.2** Reason abstractly and quantitatively. (5-PS1-1)
- **MP.4** Model with mathematics. (5-PS1-1)
- **5.NBT.A.1** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-PS1-1)
- **5.NF.B.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (5-PS1-1)
- **5.MD.C.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement. (5-PS1- 1)
- **5.MD.C.4** Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5-PS1- 1)

NJSLS: Computer Science and Design Thinking

- **8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.
- **8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Career Readiness, Life Literacies, and Key Skills

Technology Integration

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- **9.4.5.CI.3:** Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity.
- **9.4.5.CI.4:** Research the development process of a product and identify the role of failure as a part of the creative process.
- **9.4.5.IML.2:** Create a visual representation to organize information about a problem or issue.

Career Education

CRP 8. SW utilize critical thinking to make sense of problems and persevere in solving them by completing the Mystery Science challenge.
CRP 11. SW use technology to enhance productivity by accessing the following online resources:

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

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