



Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

SPARTAN MISSION:

Meeting the needs of all students with a proud tradition of academic excellence.

DEPARTMENT: Science

COURSE: Science, Grade 6

Curriculum Development Timeline

School: Township of Ocean Intermediate School

Course: Science, Grade 6

Department: Science

Board Approval	Supervisor	Notes
February 2009	Patrick Sullivan	Born Date
June 2011	Patrick Sullivan	Revisions
August 2017	Patrick Sullivan	Revisions
March 2019	Patrick Sullivan	Review
August 2021	Patrick Sullivan	Alignment to Standards and Revisions
August 2022	Patrick Sullivan	Incorporate State Mandates
August 2024	Patrick Sullivan	Updated to include New State Mandates
August 2025	Patrick Sullivan	Alignment to Standards and Revisions
August 2026	Patrick Sullivan	Revisions

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Township of Ocean Pacing Guide			
Week	Quarter 1	Week	Quarter 3
1	Science Lab Safety/ Scientific Practices	21	Earth Science: Earth's Place in the Universe, Earth's Systems
2	Current Events/ Introduce Science Reading & Writing Skills	22	Earth Science: Earth's Place in the Universe, Earth's Systems
3	Earth & Space Science: Earth and Human Activity	23	Earth Science: Earth's Place in the Universe, Earth's Systems
4	Earth & Space Science: Earth and Human Activity	24	Earth Science: Earth's Place in the Universe, Earth's Systems
5	Earth & Space Science: Earth's Systems	25	Earth Science: Earth's Place in the Universe, Earth's Systems, Earth and Human Activity
6	Earth & Space Science: Earth's Systems	26	Earth Science: Earth's Place in the Universe, Earth's Systems, Earth and Human Activity
7	Earth & Space Science: Earth's Systems	27	Earth Science: Earth's Place in the Universe, Earth's Systems, Earth and Human Activity
8	Earth & Space Science: Earth's Systems Physical Science: Matter and Its Interactions	28	Earth Science: Earth's Place in the Universe, Earth's Systems, Earth and Human Activity
9	Earth & Space Science: Earth's Systems Physical Science: Matter and Its Interactions	29	Earth Science: Earth's Systems/ Earth and Human Activity/ Physical Science: Matter and Its Interactions/ Energy
10	Earth & Space Science: Earth's Systems	30	Earth Science: Earth's Systems/ Earth and Human Activity/

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	Physical Science: Matter and Its Interactions		Physical Science: Matter and Its Interactions/ Energy
Week	Quarter 2	Week	Quarter 4
11	Earth Science: Earth's Systems/ Earth and Human Activity	31	Earth Science: Earth's Systems/ Earth and Human Activity/ Physical Science: Matter and Its Interactions/ Energy
12	Earth Science: Earth's Systems/ Earth and Human Activity	32	Earth Science: Earth's Systems/ Earth and Human Activity/ Physical Science: Matter and Its Interactions/ Energy
13	Earth Science: Earth's Systems/ Earth and Human Activity	33	Earth Science: Earth's Systems/ Earth and Human Activity/ Physical Science: Matter and Its Interactions/ Energy
14	Earth Science: Earth's Systems/ Earth and Human Activity	34	Earth Science: Earth's Systems/ Earth and Human Activity
15	Earth Science: Earth's Systems/ Earth and Human Activity	35	Earth Science: Earth's Systems/ Earth and Human Activity
16	Earth Science: Earth's Systems/ Earth and Human Activity	36	Earth Science: Earth's Place in the Universe
17	Earth Science: Earth's Systems/ Earth's Place in the Universe	37	Earth Science: Earth's Place in the Universe
18	Earth Science: Earth's Systems/ Earth's Place in the Universe	38	Earth Science: Earth's Place in the Universe
19	Earth Science: Earth's Systems/ Earth's Place in the Universe	39	Earth Science: Earth's Place in the Universe
20	Earth Science: Earth's Systems/ Earth's Place in the Universe	40	Year End Review

Climate Change: Earth's Systems (NJSL-S: MS-ESS3-5)

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Core Instructional & Supplemental Materials including various levels of Texts

Texts/Print Materials:

Holt/Science + Technology Series: Holt, Reinhart, Winston
Inside the Restless Earth
Water on Earth
Introduction to Matter
ScienceWorld Magazine by Scholastic

Digital Resources Across All Levels: (D=differentiated)

Gizmos (D)
IXL (D)
EdPuzzle (D)
Science World/Scholastic online
BrainPOP
Newsela (D)
Wayground (D)
Weather Wiz Kids

Time Frame	Unit 1 (10 weeks)
Topic	
- Science Practices/Lab Safety and Procedures - Understanding Scientific Explanation - Evidence through Active Investigations - Earth Systems; Cycling of water driven by sun's energy - Earth & Human Activity; Aquatic environments, health of watersheds, fresh vs salt water analysis, importance of clean water on earth; human impact on water & conservation	
<u>Alignment to Standards</u>	
MS-ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. MS-ESS2-4: Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	

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MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

MS-ESS3-2: Students who demonstrate understanding can: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused climate change over the past century.

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.

MS-ETS1: 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 safely gather information to describe and explain the natural and designed world?
- Why is cooperation and sharing of information critical to science?
- Observations are used to categorize, represent and interpret the natural world.
- Evidence is gathered for building, refining, and/or critiquing scientific explanations.
- Scientific knowledge builds upon itself over time and changes to fit new evidence.

Learning Activities:

- Lab Safety Protocols/Guidelines
- Metric Measurement stations
- Water's Journey -exploration stations
- Watershed Lab
- Analyzing point vs nonpoint source pollution maps
- Density Tank Salt water vs Fresh Lab
- Ocean Currents Lab
- Cleaning Up the Mess Oil Spill Lab
- Weather Map Activity

Assessments

Formative:

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COURSE: Science, Grade 6

- Formative assessments-Exit slip-What are examples of point and nonpoint source pollutants?
- Gizmos: Journey through the water cycle activity and journal entry
- Gizmos: Impact of currents on climate and journal entry
- Discussion of the different types of storms students have experienced.
- Science World or Newsela for current events

Summative:

- Model the global movements of water due to temperature
- Model water changing position due to density
- Prediction of weather patterns
- Explain interactions involving sunlight, the ocean, the atmosphere, ice, landforms and living things

Benchmark:

- Using lab tools for measuring/calculating density (skills)

Alternative:

- Hurricane Project
- Defined Stem engineering activity: Ferries
- Weather Map Activity
- Engineer a Barge STEM activity

Interdisciplinary Connections

ELA:

Open-Ended Real World Application Questions, Writing Predictions Activity, Lab Report

W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

- A. Introduce claim(s) about a topic or issue and organize the reasons and evidence logically.
- D. Establish and maintain a formal/academic style, approach, and form.
- E. Provide a concluding statement or section that follows from the argument presented.

RI.AA.6.7. Trace the development of and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

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COURSE: Science, Grade 6

RL.MF.6.6. Compare and contrast information or texts to develop a coherent understanding of a theme, topic, or issue when reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text.

SL.PE.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Mathematics:

6.RP. A.1. Ratios Proportional Relationships. Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities.

6.RP. A.3.d. Ratios Proportional Relationships. Use ratio reasoning to cover measurement units

6.NS.B.3. The Number System. With accuracy and efficiency, add, subtract, multiply, and divide multi-digit decimals using standard algorithm for each operation.

6.NS.C.5. The Number System. 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).

6.NS.C.7.b. The Number System. Write, interpret, and explain statements of order for rational numbers in real-world contexts.

6.EE.B.6. Expressions and Equations. Use variables to represent numbers and write expressions when solving real-world or mathematical problem; understand variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.SP.B.5.a. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations.

6.SP.B.5.b. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

Career Readiness, Life Literacies, and Key Skills

9.2.8.CAP.2: Develop a plan that includes information about science career areas of interest.

Technology Integration

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DEPARTMENT: Science

COURSE: Science, Grade 6

Career Education

CRP1: Act as a responsible and contributing citizen and employee.

CRP4: Communicate clearly and effectively and with reason.

CRP12: Work productively in teams while using cultural global competence.

Time Frame

Unit 2 (10 weeks)

Topic

Earth Science: Earth and Human Activity/Earth Systems

Alignment to Standards

MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

MS-ESS3-1: Students who demonstrate understanding can: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects

MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Learning Objectives and Activities

Learning Objectives:

- Human activities, such as the release of greenhouse gasses from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming).
- Humans depend on Earth's land, ocean, atmosphere and biosphere for many different resources.
- Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes.

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COURSE: Science, Grade 6

- The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns.
- Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents.
- Resources are distributed unevenly around the world as a result of past geologic processes.

Learning Activities:

- Windmill Engineering STEM activity
- Natural Disaster map tracking/analysis
- Analyze techniques engineers use to mitigate natural disaster
- Graphing production and use of fossil fuels in the United States
- Alternative energy sources project and presentation
- Hurricane tracking/mapping
- Renewable and Non renewable resources activities
- Water pollution/usage data activities
- Weather: air masses, fronts, severe storms, weather patterns, and climate change activities/labs

Assessments

Formative:

- Exit slip-what are the causes of plate movements, volcanoes, earthquakes?
- Discussion / project presentations -Alternative energy sources pros and cons of each
- Describe different sources of energy and how most can be traced back to the sun
- Reflection-human activity and link to weather patterns and climate shift
- Science World, ReadWorks or Newsela for current events

Summative:

- Map surface currents and explain how they are influenced by wind, earth's rotation, and climate.
- Summarize density influences on deep currents
- Draw and label the global oceanic conveyor and how human activity can disrupt this natural global climate regulator
- Graph hurricane activity and explain the forces that fuel or contribute to the end of the hurricane

Benchmark: N/A

Alternative:

- Design, build and test earthquake resistant structures STEM activity
- Design, build and test a hurricane proof structure (wind/water affect)

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COURSE: Science, Grade 6

- Formulate hypotheses on how/why meteorological data differs from one location to another with completion of climograph data packet

Interdisciplinary Connections

ELA:

SL.PE.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

SL.II.6.2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

SL.PI.6.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate speaking behaviors (e.g., eye contact, adequate volume, and clear pronunciation).

SL.UM.6.5. Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue.

W.SE.6.6. Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence. 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.

Mathematics:

6.NS.C.5. The Number System. 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).

6.NS.C.7.b. The Number System. Write, interpret, and explain statements of order for rational numbers in real-world contexts.

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COURSE: Science, Grade 6

6.SP.B.5.a. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations.

6.SP.B.5.b. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions 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.

Technology Integration

Career Education

CRP1: Act as a responsible and contributing citizen and employee.

CRP4: Communicate clearly and effectively and with reason.

CRP12: Work productively in teams while using cultural global competence.

Time Frame	Unit 3 (6 weeks)
Topic	
Earth's Place in the Universe; Earth's Systems	
Alignment to Standards	
MS-ESS1-4: Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	

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COURSE: Science, Grade 6

Learning Objectives and Activities

Learning Objectives:

- How can a design model be modified to ensure a successful solution?
- The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful.
- A solution needs to be tested, and then modified on the basis of the test results, in order to improve it.
- Models of all kinds are important for testing solutions.
- Plate Tectonics and LargeScale System Interactions Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.
- The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future

Learning Activities:

- Create rock cycle models to include and explain geologic processes that shape/change Earth
- Real Fake Rock Project
- Map/Name Tectonic Plates and Plate Boundaries
- Map Ring of Fire
- Track real-time volcanoes and earthquakes;collect/analyze data
- GIZMOS: Rock Cycle and Building Pangaea: analyzing evidence of changes in Earth's geologic history

Assessments

Formative:

- Discussion: How has our planet changed?
- Collection and analysis of data
- Creating maps, graphs, and models that demonstrate learning of changing Earth.

Summative:

- Rock Project
- Present information to the class
- Plate tectonics maps
- Faults models

Benchmark: N/A

Alternative:

- Use the Engineering Process to design, build and test a rubber band powered car.
- Evaluate competing design solutions based upon agreed-upon design criteria.

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COURSE: Science, Grade 6

- Women in STEM project
- Tin foil boats and mass

Interdisciplinary Connections

ELA:

W.WR.6.5. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

W.SE.6.6. Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue.

SL.PE.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

SL.II.6.2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

Mathematics:

6.NS.C.7.b. The Number System. Write, interpret, and explain statements of order for rational numbers in real-world contexts.

6.SP.B.5.a. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations.

6.SP.B.5.b. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

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COURSE: Science, Grade 6

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.

Technology Integration

Career Education

CRP1: Act as a responsible and contributing citizen and employee.

CRP4: Communicate clearly and effectively and with reason.

CRP12: Work productively in teams while using cultural global competence.

Time Frame	Unit 4 (7 weeks)
Topic	
Earth Science: Earth and Human Activity/ Earth's Systems	
Alignment to Standards	

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COURSE: Science, Grade 6

MS-ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused climate change over the past century.

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.

MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

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.

Learning Objectives and Activities

Learning Objectives

- When the motion energy of an object changes, there is inevitably some other change in energy at the same time.
- Energy may take different forms (e.g. energy in fields, thermal energy, energy of motion).
- The transfer of energy can be tracked as energy flows through a designed or natural system.
- Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming).

Learning Activities:

- Thermal Energy Lab
- Density Liquid Layering Activity
- Energy Sources slideshow project and presentations
- Density of Gases demonstration
- GIZMOS: Energy Conversions web-based lab

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COURSE: Science, Grade 6

- Claim-Evidence-Reasoning:Egg demonstration

Assessments

Formative:

- Exit slips
- Graphing energy production and consumption
- Gizmos Energy Conversions
- Model density with solar tubes

Summative:

- Energy sources icons t-chart in journal
- Energy sources project
- Density scenarios

Benchmark: N/A

Alternative:

- Fizz Quiz Lab
- Potato Lab
- Lava lamp engineering activity
- Density of Solids Lab
- Density of Liquids Lab

Interdisciplinary Connections

ELA:

W.WR.6.5. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

W.SE.6.6. Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

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RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue.

SL.PE.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

SL.PI.6.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate speaking behaviors (e.g., eye contact, adequate volume, and clear pronunciation).

SL.II.6.2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

Mathematics:

6.NS.C.5. The Number System. 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).

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6.SP.B.5.b. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

Career Readiness, Life Literacies, and Key Skills

Technology Integration

Career Education

CRP12: Work productively in teams while using cultural global competence.

Time Frame	Unit 5 (6 weeks)
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DEPARTMENT: Science

COURSE: Science, Grade 6

Topic

Earth Science: Earth's Place in the Universe

Alignment to Standards

MS-ESS1-1: Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

MS-ESS1-2: Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

MS-ESS1-3: Analyze and interpret data to determine scale properties of objects in the solar system.

MS-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.

Learning Objectives and Activities

Learning Objectives:

- What role does gravity play in our solar system, galaxy and universe?
- Explain gravity vs. weight with experimental data collection
- Create model to explain tides and how gravity plays a role
- Patterns of the apparent motion of the sun, the moon and stars in the sky can be observed, described, predicted and explained with models.
- The solar system consists of the sun and a collection of planets, their moons and asteroids that are held in orbit around the sun by its gravitational pull on them.
- Model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year.
- Model moon phases and explain how alignment of the sun, moon, Earth are causing us to see changing patterns of the sun.

Learning Activities:

- Gravity Exploration Lab
- GIZMOS Gravitational Force
- Hot Air Balloon WebQuest
- Solar Tube Activity
- ScienceSaurus notes/ investigation

Assessments

Formative:

- Gravity Exploration Lab / data, results, conclusion
- Discussion: Revolution or rotation?

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- Reflection: Hot Air Balloon

Summative:

- Model the cyclic patterns of lunar phases
- Model eclipses of the Sun and Moon
- Describe the relationship between the sun and change of seasons

Benchmark: N/A

Alternative:

- GIZMOS: Gravity Pitch
- Rotate, Revolve or Both CER activity
- Big Bang graphic organizer

Interdisciplinary Connections

ELA:

W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

SL.PE.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

SL.PI.6.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate speaking behaviors (e.g., eye contact, adequate volume, and clear pronunciation).

L.VL.6.3. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, including technical meanings, choosing flexibly from a range of strategies.

Mathematics:

6.NS.C.5. The Number System. 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).

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6.NS.C.7.b. The Number System. Write, interpret, and explain statements of order for rational numbers in real-world contexts.

6.SP.B.5.a. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations.

6.SP.B.5.b. Statistics and Probability. Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

Career Readiness, Life Literacies, and Key Skills

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.

Technology Integration

Career Education

CRP1: Act as a responsible and contributing citizen and employee.

CRP12: Work productively in teams while using cultural global competence

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

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

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-My classes often use journals (notebooks) for taking notes, vocabulary terms and definitions, interactive lessons, and lab notes. These provide a reference of the work done throughout the school year.

-Currently I do not assign a year-end presentation or cumulative assessment/project as mentioned in the document.

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