Science Unit 1- Plan
6th Grade

Unit Time Frame:
September 9, 2014 to December 22, 2014

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Science Unit 1
Grade 6

Unit Overview

Students will begin this unit with the exploration of energy, heat density and buoyancy. They will discover how all are related to the weather, ocean currents plate tectonics, formation of stars and more. They then will discover that the amount of water on Earth has not changed over time, the percentage of water on Earth, and how water moves naturally around the Earth. As the unit progresses, the students will learn about weather and climate, and what factors influence it. Then they will take a look at Earth's oceans' characteristics, currents, waves, beaches, and the features of the deep ocean floor. Students will finish this unit with a look at how scientists "read" Earth's history from layers of rock and fossils through relative and absolute dating.

Primary Interdisciplinary Connections: Math, Language Arts, Social Studies

21st Century : Global connections

Enduring Understanding:	***Unit Essential Questions:***
Students will understand that….. • Objects will sink or float depending on the relationship of the gravitational pull on the object and the upward force of the liquid it displaces. • Density of an object in relationship to the density of the liquid that it is placed in will determine how it will sink or float. • Buoyancy is the upward force of a liquid on an object placed in it. • Gravity is the attraction of two objects. Force is a push or pull. • Density is mass per volume, Mass is the amount of matter in an object. • Volume is the amount of space an object occupies. • Earth has one big ocean with many features. • The ocean and life in the ocean shape the features of Earth. • The ocean is a major influence on weather and climate. • The ocean makes Earth habitable. • The ocean supports a great diversity of life and ecosystems. • The oceans and humans are inextricably linked. • The ocean is largely unexplored. • Develop, communicate and justify an evidence-based scientific explanation to account for Earth's different climates. • Research and evaluate direct and indirect evidence to explain how climates vary from one location to another on Earth. • Examine, evaluate, and question information from a variety of sources and media to investigate how climates vary from one location to another on Earth. • The amount of water on Earth has remained about the same for millions of years.	• What is matter? What is not? • Can matter be created or destroyed? • How do changes in states of matter affect me? • What happens when water falls from the clouds and lands on the ground? Where does it go? • How does the climate in one area compare and contrast with another area? • Why are there different climates on Earth? • How has Earth's climate changed over time? • What evidence supports and/or contradicts human influence on climate change? • What is the difference between weather and climate?
Knowledge:	***Skills:***
Students will know….	***Student will be able to ….***

• That the scientific process is a continuous method of investigation. • Causes of wind and weather patterns. • Factors affecting climate. • Causes of the Coriolis effect. • How events in one geographical area affect another. • How climate affects agriculture. • How these factors affect the long term climate • Matter is neither created nor destroyed, but can change states. • State of matter is dependent on energy and density of particles. • Changes in states of matter causes natural continuous cycles on Earth. (water cycle, rock cycle, convection weather patterns)	• Students will be able to interpret data tables, charts, and graphs allow people to compare and contrast various climates around the globe. • Students will be able to interpret computer models help people understand past, present, and future climates. • Measuring temperature, mass, volume • Calculating density. • Identifying examples of states of matter.
Evidence of Understanding:	
Unit Pre-Assessment Notebook Investigation Entries Performance Assessments My Journal Entries Student Observation/Anecdotal Notes Homework Readorium Chapter Assessments	Unit Pre-Assessment Chapter 3 Assessments Notebook Investigation Entry 4A Chapter 4 Assessments My Journal Entries -6.3 Biodiversity Student Observation/Anecdotal Notes- Chapter 6 Chapter 6 Assessment Chapter 7 Assessment Notebook Investigation Entry 9A Chapter 9 Assessments

Preconception /Misconceptions

Density and Buoyancy

- Water is pushing up on the object
- Weight determines if an object will sink or float.
- Heavy objects always sink and light objects always float.
- A larger heavier object will not float as well as a smaller lighter object of the same material.
- The amount of water will cause objects to float or sink better.
- There must be more water for larger objects to float.
- Weight of the water must be more than the weight of the object.
- Objects with holes will always sink.
- Objects with air float.
- Objects float on top of the liquid.
- Fish don't float unless they are dead.
- Oil sinks because there is more water than oil. If there were more oil, the oil would be on the bottom.
- Water is on the bottom, because it was poured in first.
- Density is the thickness of something.
- Oil is always on top because it repels water, corn syrup has some oil in it and it would be between oil and water, anything mixed with oil separates.
- The more air pockets in something the more it will float. Wax, ice, has lots of air pockets in it and floats.
- Liquids are liquids and will all mix together.

List other that you discover in your class:

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Water Cycle

- Expansion of matter is due to the expansion of the particles, rather than the increase of particle spacing.
- Water atoms themselves expand or change when ice melts.
- The water cycle involves freezing and melting of water.
- Water only gets evaporated from the ocean or lakes.
- When water boils and bubbles come up the bubbles are air.
- The bubbles are oxygen or hydrogen.
- Ice molecules are colder than water molecules.
- Condensation on the outside of a container is water that seeped through the container itself.
- The coldness comes through the container and produces water.
- Condensation is when air turns into a liquid.
- Condensation on the outside of a container is water that seeped through the container itself.
- The coldness comes through the container and produces water.
- Condensation is when air turns into a liquid.
- Raindrops look like tear drops.
- Rain falls out of the sky when the clouds evaporate.

- Rain comes from holes in clouds.
- Rain falls from funnels in the clouds.
- Clouds (and rain) are made by God (Piaget as cited in Bar, 1989 & Dove, 1998).
- Clouds come from somewhere above the sky.
- Empty clouds are refilled by the sea.
- Clouds are formed by boiling - vapors from kettles or the sun boiling the sea. Clouds are made of cold, heat, fog, snow or night.
- Clouds are mostly smoke, made of cotton or wool, or they are bags of water.
- Clouds are sponges that hold water.
- Clouds are water vapor.
- Clouds are dust particles.
- Thunder occurs when two clouds collide.

List other that you discover in your class:

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Oceans

- Oceans shaped like a bowl, deepest in the middle.
- Sea floor is flat.
- Bottom of ocean is a big sandy desert.
- Coasts and coastlines don't change.
- Ocean is blue because it reflects the color of the sky.
- Earth's oceans are separate and are not connected,
- Oceans are unrelated to the weather.

List other that you discover in your class:

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Before beginning unit administer pretest. (Week of 9/8/2014) Check that all materials are available, usable, and ready

Materials Provided:

Materials are supplied by the Teacher or School Site: Be aware that the classroom teacher or school site must supply a few items. Here is a summary of those items needed for chapters 3, 4, 6, 7, & 9.

Chapter 3:	Chapter 4:	Chapter 6:
▪ Balloons ▪ Flask ▪ Ice water ▪ Bucket of warm water ▪ Geobox ▪ Candle ▪ Long fireplace matches ▪ Safety goggles ▪ Incense ▪ Aluminum weighing dish ▪ Small piece cardboard ▪ Samples of 1 lb. items i.e. Wooden block, Styrofoam peanuts, copper or metal blocks, cotton balls, clay, paper clips, wax, pennies ▪ Displacement tank, density cubes ▪ Balance, 100 ml graduated cylinder, 250 ml beaker ▪ Water ▪ Paper towels ▪ Disposable cup ▪ Simple calculator ▪ Deep basin ▪ Tub toys ▪ 2 soda bottles (12 or 24 oz.) ▪ 2 digital thermometers ▪ Light source ▪ Black paper ▪ White paper, ▪ Stopwatch ▪ Tape ▪ Metric ruler	▪ Water (bottled) ▪ Beaker ▪ Table salt ▪ Balance ▪ 2 geoboxes ▪ 2 collection containers (fresh plastic cups or 2 beakers that are shorter than geobox) ▪ Weights ▪ Plastic wrap ▪ Masking tape ▪ Metric ruler ▪ Glass mason jar with lid ▪ Water ▪ Ice ▪ Matches ▪ Black construction paper ▪ flashlight ▪ Sling psychrometer ▪ Relative humidity chart ▪ Stopwatch ▪ Graph paper ▪ Water in wide-mouth container ▪ Vaporizer ▪ Simple calculator ▪ 10 oz. glass ▪ 20 oz. glass ▪ Potted plant ▪ Clear plastic gallon storage bag ▪ Twist tie ▪ Toothbrush ▪ Toothpaste ▪ Container to fit under faucet ▪ Measuring cup with ml markings	▪ Weather tools set ▪ Cloud chart ▪ Beaufort wind scale ▪ Compass ▪ Graph paper ▪ Blue and pink highlighter pens ▪ Large foam ball ▪ Skewer ▪ Flashlight ▪ Stopwatch ▪ Radar image plates (set of 6) ▪ Metric ruler ▪ Large clear plastic container ▪ Ice cubes dyed blue ▪ Red food coloring ▪ Warm water ▪ Permanent marker
Chapter 7	Chapter 9	
▪ Chilled bottle of oil and vinegar dressing ▪ Clear plastic cup ▪ 2 foam coffee cups ▪ Eyedropper ▪ Pipette ▪ Salt ▪ Teaspoon ▪ 10 cm square cardboard	▪ Empty aquarium of large container ▪ Number of dated objects like a coin, stamp, soil, and a number of undated objects ▪ 2 plastic soda bottles (1-L capacity) ▪ Scissors ▪ Permanent markers	

▪ Pencil ▪ Scissors ▪ 20 staples ▪ newspapers ▪ Cafeteria tray or paper plate ▪ Hot and cold water ▪ Food coloring ▪ Photographs and/or video clips of different beach locations ▪ *Magic School Bus On The Ocean Floor* book ▪ Index cards ▪ Selection of informational books on t he ocean ▪ Bathymetric map ▪ Colored markers ▪ Tray ▪ Two baby food jars ▪ Water red and blue food coloring ▪ Salt ▪ Large index card	▪ Soil mixture (1:1 topsoil to sand) ▪ Newspaper ▪ Beaker ▪ Metric ruler ▪ Spoon ▪ Sedimentary rock samples (for t he teacher and a utility knife) ▪ Microscope slide of tree cross-section ▪ Tree cross section ▪ Seven paper strips (set of 4 and set of 3) ▪ 2 blank pieces of paper ▪ Graph paper ▪ Scissors ▪ Tape ▪ Colored pencils ▪ Magnifying lens ▪ 4 small containers (like film canisters) ▪ 30 pennies ▪ Paper plates	

Addresses in Unit 1
New Jersey Common Core Standards

5.1 Science Practices	All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.
Strand A	**Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world. Who, what, when, where, why, and how questions form the basis for young learners' investigations during sensory explorations, experimentation, and focused inquiry**
5.1.4.A.1	Fundamental scientific concepts and principles and the links between them are more useful than discrete facts.
5.1.4.A.2	Outcomes of investigations are used to build and refine questions, models, and explanations.
Strand B	**Generate Scientific Evidence Through Active Investigations: Observations and investigations form young learners' understandings of science concepts.**
5.1.4.B.1	Building and refining models and explanations requires generation and evaluation of evidence.
5.1.4.B.2	Tools and technology are used to gather, analyze, and communicate results.
5.1.4.B.3	Evidence is used to construct and defend arguments
5.1.4.B.4	Reasoning is used to support scientific conclusions.
Q Strand C	**Reflect on Scientific Knowledge: Interacting with peers and adults to share questions and explorations about the natural world builds young learners' scientific knowledge.**
5.1.4.C.1	Scientific understanding changes over time as new evidence and updated arguments emerge.
5.1.4.C.2	Revisions of predictions and explanations occur when new arguments emerge that account more completely for available evidence.
Strand D	**Participate Productively in Science: Science practices include drawing or "writing" on observation clipboards, making rubbings, or charting the growth of plants.**
5.1.4.D.1	Science has unique norms for participation. These include adopting a critical stance, demonstrating a willingness to ask questions and seek help, and developing a sense of trust and skepticism.
5.1.4.D.2	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 (e.g., scientific argumentation and representation).
5.1.4.D.3	Instruments of measurement can be used to safely gather accurate information for making scientific comparisons of objects and events.
5.2 Physical Science	Physical Science: All students will understand that physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.

Strand D	**A. Properties of Matter:** All objects and substances in the natural world are composed of matter. Matter has two fundamental properties: matter takes up space, and matter has inertia.
5.2.4.A.2	Each state of matter has unique properties (e.g., gases can be compressed, while solids and liquids cannot; the shape of a solid is independent of its container; liquids and gases take the shape of their containers).
5.2.6.A.1	The volume of some objects can be determined using liquid (water) displacement.
5.2.6.A.2	The density of an object can be determined from its volume and mass
5.2.6.A.3	Pure substances have characteristic intrinsic properties, such as density, solubility, boiling point, and melting point, all of which are independent of the amount of the sample.
Strand C	**Forms of Energy:** Knowing the characteristics of familiar forms of energy, including potential and kinetic energy, is useful in coming to the understanding that, for the most part, the natural world can be explained and is predictable.
5.2.6.C.3	The transfer of thermal energy by conduction, convection, and radiation can produce large-scale events such as those seen in weather.
5.2.8.C.1	A tiny fraction of the light energy from the Sun reaches Earth. Light energy from the Sun is Earth's primary source of energy, heating Earth surfaces and providing the energy that results in wind, ocean currents, and storms.
5.2.8.D.1	When energy is transferred from one system to another, the quantity of energy before transfer equals the quantity of energy after transfer. As an object falls, its potential energy decreases as its speed, and consequently its kinetic energy, increases. While an object is falling, some of the object's kinetic energy is transferred to the medium through which it falls, setting the medium into motion and heating it.
5.3 Earth Science	**Earth Systems**: All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.
Strand B	**History of Earth:** From the time that Earth formed from a nebula 4.6 billion years ago, it has been evolving as a result of geologic, biological, physical, and chemical processes.
5.4.6.B.1	Successive layers of sedimentary rock and the fossils contained in them tell the factual story of the age, history, changing life forms, and geology of Earth.
5.4.6.B.2	Earth's current structure has been influenced by both sporadic and gradual events. Changes caused by earthquakes and volcanic eruptions can be observed on a human time scale, but many geological processes, such as mountain building and the shifting of continents, are observed on a geologic time scale.
5.4.6.B.3	Moving water, wind, and ice continually shape Earth's surface by eroding rock and soil in some areas and depositing them in other areas.
Strand D	**Tectonics:** The theory of plate tectonics provides a framework for understanding the dynamic processes within and on Earth.
5.4.6.D.1	Lithospheric plates consisting of continents and ocean floors move in response to movements in the mantle.
5.4.6.D.2	Earth's landforms are created through constructive (deposition) and destructive (erosion) processes.
Strand E	**Energy in Earth Systems:** Internal and external sources of energy drive Earth systems.
5.4.6.E.1	The Sun is the major source of energy for circulating the atmosphere and oceans.
5.4.8.E.2	The Sun provides energy for plants to grow and drives convection within the atmosphere and oceans, producing winds, ocean currents, and the water cycle.
Strand F	**Climate and Weather**: Earth's weather and climate systems the result of complex interactions between land, ocean, ice, and atmosphere.
5.4.6.F.1	Weather is the result of short-term variations in temperature, humidity, and air pressure.
5.4.6.F.2	Climate is the result of long-term patterns of temperature and precipitation.

Next Generation Science Standards

Performance Expectations

ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geological timescale is used to organize Earth's 4.6 billion year old history.

ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

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.

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

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

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.

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.

ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

NGSS Science and Engineering Practices

Developing and Using Models

Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ESS1-1., ESS1-2

Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.

Develop and use a model to describe phenomena. (MS-ESS2-1)

Develop a model to describe unobservable mechanisms. (MS-ESS2-4)

Planning and Carrying Out Investigations

Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

Analyze and interpret data to provide evidence for phenomena. (MS-ESS2-3)

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

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.(ESS2-2)

Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

Engaging in Argument from Evidence

Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

*Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3)

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and validity of ideas and methods.

*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. (MS-LS1-8).

Disciplinary Core Ideas

ESS1.C Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (ESS2-3)

ESS2.A Earth's Materials and Systems. 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. (ESS2-2)

ESS2.B Plate Tectonics and Large-Scale System Interactions. Maps of ancient land and water pattern, based on investigations of rocks and fossils make clear how Earth's plates have moved great distances, collided, and spread apart. (ESS2-3)

ESS2.C The Roles of Water on Earth's Surface Processes. Water's movements-both on the land and underground, cause weathering and erosion, which change the land's surface features and create underground formations. (ESS2-2)

ESS2.A Earth's Materials and Systems. All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (ESS2-1)

ESS2.C The Roles of Water in Earth's Surface Processes. Water continually cycles among land, ocean and atmosphere via transpiration evaporation condensation and crystallization, and precipitation, as well as downhill flows on land. (ESDS2-4) Global movements of water and its changes in form are propelled by sunlight and gravity. (ESS2-4)

ESS3.A Natural Resources. 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. These resources are distributed unevenly around the planet as a result of past geologic processes. (ESS3-1)

Cross Cutting Concepts

Cause and Effect
Cause and effect relationships may be used to predict phenomena in natural or designed systems. (ESS3-1)
Energy and Matter
Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (ESS2-4)
Stability and Change
Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (ESS2-1)
Patterns
Patterns in rates of change and other numerical relationships can provide information about natural and human designed systems. (ESS2-3) Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (ESS1-2, Ess2-2)
Systems and System Models
Models can be used to represent systems and their interactions-such as inputs, processes, and outputs- and energy, matter, and information flows with systems. (ESS2-6)
Scale and Proportion
Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (ESS2-6)

Common Core State Standards

CCSS: English Language Arts	
Reading Informational Text	
RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST6-8.9	Compare and contrast the information gained from experiments, simulations, video or multimedia sources with that gained from reading a text on the same topic.
CCSS: Writing-	
W6.1	Write arguments to support claims with clear reasons and relevant evidence..
W6.2	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
CCSS: Speaking and Listening:	
SL.7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL8.5	Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
CCSS: Mathematics	
6-EEB.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

UNIT 1

Chapter 3Physical Science Connection

Summary

3.1 Students explain the role of the sun as the ultimate source of energy.
3.2 Compare and contrast potential and kinetic energy.
3.3In this part, students recognize that heat is a form of energy and can be transferred from one object to another.

Core Ideas/Understandings	*S&E Practices Alignment*	*CC Concepts Alignment*
• Heat is a form of energy related to the random motion of atoms and molecules. • Define density as ratio of mass per unit volume (D = m/v)	***NGSS*** Developing and Using Models	***NGSS*** Energy and Matter Stability and Change

Focus Questions

- What is energy?
- What is the difference between temperature and heat?
- Why do some things float and other things sink?

New Vocabulary

Energy, kinetic energy, potential energy, power plant, extend, density, buoyant force, fluid

Teacher Preparations	Body of Evidence	Time Frame
-Prepare materials for the week -Administer pre-assessment for chapter 3 -Read: "Motivate", "Explore", "Explain", "Extend", and "Assess" Complete investigations: 3A *Convection in Earth's Atmosphere, &3B Density* *-End of chapter 3 administer post assessment* Scores sent to District Data to be recorded in Genesis	• Notebook Investigation Entries • Lab Investigation 3A • Lab Investigation 3B • My Journal Entries pgs. 57, 63 • Chapter Review Questions • Student Observation/Anecdotal Notes • Chapter 3Assessments	4 sessions 1 session = 80 minutes

Homework/Center Activities/Extra Practices

- Rising Readorium
- Chapter "Challenges" pgs. 59, 65
- Chapter "Solve It" pgs. 61, 67, 71
- Chapter Connection pg. 72
- Chapter Activity pg. 74
- Word wall activities
- Informational Text -Reading
- Suggested websites
- Spelling City(vocab.)

Culminating project: Solar Radiation-see end of chapter for details pg. 77

Chapter 4 Water and the Water Cycle

Summary

4.1 Students Recognize the hydrosphere as Earth's water system. They also identify the sources of Earth's freshwater. Students discuss the importance of water and compare and contrast surface water to groundwater.
4.2 Students recognize the role of the sun as a major energy source. They summarize the processes of the water cycle and differentiate between an aquifer and a watershed. Students describe how geysers and hot springs are part of the water cycle.

Core Ideas/Understandings	*S&E Practices Alignment*	*CC Concepts Alignment*
• Water on Earth is part of the hydrosphere. • Water moves continually between atmosphere and hydrosphere.	*NGSS* Developing and Using Models	*NGSS* Energy and Matter

Focus Questions

- Where is most of Earth's water found?
- How is a mud puddle part of the water cycle?
- What is the difference between an aquifer and a watershed?

New Vocabulary

Hydrosphere, atmosphere, surface water, reservoir, glacier, groundwater, water table, water cycle, evaporation, water vapor, transpiration, condensation, precipitation, aquifer, watershed, surface runoff, percolation

Teacher Preparations	Body of Evidence	Time Frame
-Prepare materials for the week -Administer pre-assessment for chapter 7 -Read: "Motivate", "Explore", "Explain", "Extend", and "Assess" Complete Investigations: 4A *The Water Cycle, & 4B Water in Earth's Atmosphere* *-Administer post assessment* Scores sent to District Data to be recorded in Genesis	• Chapter Pre-assessment • Notebook Investigation Entry • Lab Investigation 4A • Lab Investigation 4B • My Journal Entries pgs. 87, 91 • Chapter Review Questions • Student Observation/Anecdotal Notes • Chapter 4 Assessments	2 sessions

Homework/Center Activities/Extra Practices

- Rising Readorium
- Chapter "Challenges" pgs. 84
- Chapter "Solve It" pgs. 81
- Chapter Connection pg. 92
- Chapter Activity pg. 94
- Word wall activities
- Informational Text -Reading
- Suggested websites
- Spelling City(vocab.)

Culminating project: Snow-Making and Water Cycle pg. 96

Chapter 6 Weather and Climate

Summary

6.1 Students describe the factors that affect weather. They recognize the role of convection in the atmosphere. Students explain the Coriolis effect and distinguish between different wind patterns. They will describe the relationship between air and water vapor.
6.2 Students will recognize the role of a meteorologist and describe how water exists in the atmosphere. They compare and contrast cloud formation and characteristics. They will identify the major air masses and fronts that affect weather. Students differentiate between hurricanes and tornados.
6.3 Students describe the factors that affect climate, and recognize the different types of biomes. Students explain the characteristics of the biomes. Students summarize how plants and animals adapt to different biomes.

Core Ideas/Understandings	***S&E Practices Alignment***	***CC Concepts Alignment***
• Sun is a major energy source for weather events • Thunderstorms, tornados, hurricanes all have potential of becoming powerful storms • Storms are violent disturbances in the atmosphere • Temperature, precipitation, elevation, latitude, and topography work together to produce different climates throughout the world.	***NGSS*** Planning and Carrying out Investigations Developing and Using Models	***NGSS*** Cause and Effect Systems and System Models

Focus Questions

- What causes wind?
- What do clouds tell you about the weather?
- Why do different parts of Earth have different

New Vocabulary

Weather, air mass, wind, thermal, convection cells, Coriolis effect, meteorologist, dew point, cloud, front, cold front, warm front, jet stream, low-pressure and high-pressure centers, isobar, storm cell, lightening, thunder, cyclone, hurricane, tornado, climate, biome, desert, grassland, temperate deciduous rainforests, tropical rainforests, taiga, tundra

Teacher Preparations	**Body of Evidence**	**Time Frame**
-Prepare materials for the week -Administer pre-assessment for chapter 7 -Read: "Motivate", "Explore", "Explain", "Extend", and "Assess" Complete Investigations: 6A *Observing the Weather*, 6B *Storms,* *-Administer post assessment* Scores sent to District Data to be recorded in Genesis	• Chapter Pre-assessment • Notebook Investigation Entry • Lab Investigation 6A • Lab Investigation 6B • My Journal Entries pgs. 127, 128, 141, 146 • Chapter Review Questions • Student Observation/Anecdotal Notes • Chapter 6 Assessments	5 sessions

Homework/Center Activities/Extra Practices

- Rising Readorium
- Chapter "Challenges" pgs. 140, 147
- Chapter "Solve It" pgs. 140
- Chapter Connection pg. 148
- Chapter Activity pg. 150
- Word wall activities
- Informational Text -Reading
- Suggested websites
- Spelling City(vocab.)

Culminating Project: Demonstrating the Coriolis Effect pg. 154

Chapter 7 Oceans

Summary

7.1 Students explain the importance of Earth's oceans and describe the sources of salt in seawater. They differentiate between surface ocean currents and deep ocean currents.
7.2 Students explain the actions and properties of water. They recognize that wind causes waves and describe a tsunami.
7.3 Students distinguish between onshore and offshore area. They explain the characteristics of tidal flats and compare and contrast summer and winter beaches. They differentiate the continental margin and deep ocean floor. Students recognize features of the ocean floor such as abyssal plain, mid-ocean ridge, and deep-ocean trenches.

Core Ideas/Understandings	*S&E Practices Alignment*	*CC Concepts Alignment*
• The oceans are important in maintaining the Earth's heat balance. • There are two characteristics that are important in controlling the density of the ocean water (salinity and temperature) • Characteristics of waves consist of crest, trough, period, wavelength, and amplitude. • Coriolis effect and the shape of the coastlines cause surface ocean currents to form gyres.	*NGSS* Developing and Using Models	*NGSS* Systems and System Models

Focus Questions

- How many oceans does Earth have?
- What factors affect the size of ocean waves?
- Where does sand come from?

New Vocabulary

Salinity, surface ocean currents, gyres, deep ocean currents, crest, trough, amplitude, wavelength, period, fetch, swell, wave train, tsunami, marine, beach, backshore, foreshore, tidal flat, coast, longshore, continental shelf, continental margin

Teacher Preparations	Body of Evidence	Time Frame
-Prepare materials for the week -Administer pre-assessment for chapter 7 -Read: "Motivate", "Explore", "Explain", "Extend", and "Assess" Complete Investigations: 7A *Observing the Weather*, 7B *Storms,* *-Administer post assessment* Scores sent to District Data to be recorded in Genesis	• Chapter Pre-assessment • Notebook Investigation Entry • Lab Investigation 7A • Lab Investigation 7B • Chapter Review Questions • Student Observation/Anecdotal Notes • Chapter 7 Assessments	5 sessions

Homework/Center Activities/Extra Practices

- Rising Readorium
- Chapter "Challenges" pgs. 161, 174, 176
- Chapter "Solve It" pgs. 160, 161, 165
- Chapter Connection pg. 178
- Chapter Activity pg. 183
- Word wall activities
- Informational Text -Reading
- Suggested websites
  Spelling City(vocab.)

Culminating project: Water Trick pg. 183 see end of chapter for details

Chapter 9 Earth and Time

Summary

9.1 Students describe relative dating and how it is used. They explain how scientists use superposition and other relative dating principles to determine the relative age of rock. Students recognize how fossils are used to determine the relative age of rock layers. Interpret illustrations to determine the relative order of events.
9.2 Students describe how geological time is divided into eras and periods. They explain how scientists use clues from Earth to determine its age. Students understand the difference between relative and absolute dating. They interpret cross-sections of trees to determine age.

Core Ideas/Understandings	*S&E Practices Alignment*	*CC Concepts Alignment*
• Scientists use relative and absolute dating to determine the age of objects. • Scientists use tree rings to understand past climates, glacier movements, climatology, droughts, and insect outbreaks.	***NGSS*** Constructing Explanations and Designing Solutions	***NGSS*** Stability and Change

Focus Questions

- How is the Grand Canyon like a history book?
- How old is Earth?
- What is the difference between relative and absolute dating?

New Vocabulary

Geology, relative dating fossil, paleontologist, geological time scale, absolute dating, radio-active decay, element, half-life

Teacher Preparations	Body of Evidence	Time Frame
-Prepare materials for the week -Administer pre-assessment for chapter 7 -Read: "Motivate", "Explore", "Explain", "Extend", and "Assess" Complete Investigations: 9A *Observing the Weather*, 9B *Storms,* *-Administer post assessment* Scores sent to District Data to be recorded in Genesis	• Notebook Investigation Entry • Lab Investigation 9A • Lab Investigation 9B • My Journal Entries pgs. 215 • Chapter Review Questions • Student Observation/Anecdotal Notes • Chapter 9Assessments	5 sessions

Homework/Center Activities/Extra Practices

- Rising Readorium
- Chapter "Challenges" pgs. 213, 219
- Chapter "Solve It" pgs. 213
- Chapter Connection pg. 220
- Chapter Activity pg. 222
- Word wall activities
- Informational Text -Reading
- Suggested websites
- Spelling City(vocab.)

Culminating project: What's Your Time Scale? Pg. 224

My Journal Writings

Chapter 3

3.1 Place an ice cube in a plastic sandwich bag and seal the bag tightly. What happens to the ice cube when you let it sit on the table (in the bag)? 2. Sketch a "before" and "after" picture in your journal. Record the time it took for the ice cube to melt.3. What could you have done to speed up the melting process? List all possibilities.

3.2 Where does conduction take place in your house? Walk through your house. In each room, observe whether or not there are objects that are involved in conduction. Based on your observations, make a list of as many examples of heat transfer by conduction as you can. Remember, in solids, the atoms and molecules are touching each other. That's why heat transfer by conduction works best between solids.

Chapter 4

4.2 Imagine you are a snowflake in an icecap on the top of a mountain. Describe what happens to you as the seasons change starting with winter. Describe your path through the water cycle. Also, describe any points along your journey where you might interact with human beings!

4.2 Research the answers to these questions for your town.1. What is the name of the watershed or aquifer that your town uses for drinking water?2. Is there a local organization that monitors the water quality of your watershed?

Chapter 6

6.1 In this section, you learned that sailors have used global wind patterns to travel to and explore new lands throughout human history. Research one of the more famous ship captains—Captain James Cook (1728–1779). Who was he? What is he known for? Write a short report about one or more of Captain Cook's adventures or achievements.

6.2 What is it like to be a meteorologist? Find out by interviewing a meteorologist or by researching the job of a meteorologist on the Internet. Write about your findings in a report. Include photographs or pictures in your report.

6.3 Packing for an adventure in the Serengeti1. On a world atlas, find the Serengeti. Describe where it is located.2. Make a prediction about the kind of weather the Serengeti will have next week.3. Then, research the seasonal weather on the Internet or in the library. Were you correct in your prediction? 4. Using what you learned, make a list of things you would need to pack in your suitcase to visit the Serengeti.

6.3 Biodiversity. Does this statement surprise you? Why or why not? The biodiversity of the desert is greater than for all other biomes with the exception of the tropical rainforest. Why is biodiversity in an ecosystem important? Write your response as a short essay.

Chapter 9

9.2 Imagine you could go back in time and visit any period of Earth's geologic history. Which period would you want to visit? Why would you want to visit this time in geologic history?

(Note there are no My Journal writings in chapter 7)

Unit Resources:

Content books

Websites:

*United streaming:

http://www.discoveryeducation.com//?ref=streaming&returnUrl=http%3A%2F%2Fstreaming%2Ediscoveryeducation%2Ecom%2Findex%2Ecfm

*Readorium