Linking Project WET and the Georgia Standards of Excellence in Science

Elementary Grades K-2	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Motion and Stability: Forces and Interactions	
	SKP2. Obtain, evaluate, and communicate information to compare and describe different types of motion. a. Plan and carry out an investigation to determine the relationship between an object's physical attributes and its resulting motion (straight, circular, back and forth, fast and slow, and motionless) when a force is applied. (Examples could include toss, drop, push, and pull.) b. Construct an argument as to the best way to move an object.
	S2P2. Obtain, evaluate, and communicate information to demonstrate changes in speed and direction using pushes and pulls. a. Plan and carry out an investigation to demonstrate how pushing and pulling on an object affects the motion of the object. b. Design and evaluate a device to change the speed or direction of an object. c. Record and analyze data to decide if a design solution works as intended to change the speed or direction of an object with a push or a pull.
	S1P2. Obtain, evaluate, and communicate information to demonstrate effects of magnets on other magnets and other objects. a. Construct an explanation of how magnets are used in everyday life. (Clarification statement: Everyday life objects could include refrigerator magnets, toys, magnetic latches, and name tags.) b. Plan and carry out an investigation to demonstrate how magnets attract and repel each other and the effect of magnets on common objects.
Energy	
Molecules in Motion – simulate molecular movement in each of water's physical states Model the effects of heat energy on water's state of mater	**S2E2. Obtain, evaluate, and communicate information to develop an understanding of the patterns of the Sun and the moon and the sun's effect on Earth.** a. Plan and carry out an investigation to determine the effect of the position of the sun in relation to a fixed object on earth at various times of the day. b. Design and build a structure that demonstrates how shadows change throughout the day. c. Represent data in tables and/or graphs of the length of the day and night to recognize the change in seasons. d. Use data from personal observations to describe, illustrate, and predict how the appearance of the moon changes over time in a predictable pattern. (Clarification statement: Students are not required to know the phases of the moon or tilt of the Earth.)
From Molecules to Organisms: Structures and Processes	
The Life Box Identify four essential factors necessary for life Explain how living things use these four factors Recognize how these four factors work together as a system	**SKL1.Obtain, evaluate, and communicate information about how organisms (alive, not alive) and non-living materials are grouped.** a. Construct an explanation based on observations to recognize the difference between organisms and nonliving materials. b. Develop a model to represent how a set of organisms and nonliving materials are sorted into groups based on their attributes.
Earth's Systems	

Elementary Grades K-2	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	SKE1. Obtain, evaluate, and communicate observations about time patterns (day to night and night to day) and objects (such as sun, moon, stars) in the day and night sky. a. Ask questions to classify objects according to those seen in the day sky, the night sky, and both. b. Develop a model to communicate with pictures and words the changes that occur in the sky during the day, as day turns into night, during the night, and as night turns into day. (Clarification statement: Students are not expected to understand tilt of the Earth, rotation, or revolution.)
Just Passing Through – vegetation affects the movement of water over land surfaces Compare the rates at which water flows down slopes with and without plant cover Identify BMPs that can be used to reduce erosion **Storm Water** List ways that humans alter and modify the physical environment Identify how humans impact water quality List, describe and compare solutions for managing storm water runoff Explain how stormwater impacts and natural landscape and a human-made cityscape Describe how solutions that mimic nature can capture, store and filter water	**S2E3. Obtain, evaluate, and communicate information about how weather, plants, animals, and humans cause changes to the environment.** a. Ask questions and obtain information about major changes to the environment in your community. b. Construct an explanation of the causes of a change to the environment in your community.
Earth and Human Activity	
Water Quality? Ask the Bugs! – monitoring techniques in the classroom Define the term macroinvertebrate Describe diverse macroinvertebrates Analyze the relationship between aquatic macroinvertebrate populations and water quality Explain the process of rapid Bioassessment of aquatic macroinvertebrates Evaluate a stream's water quality using a Pollution Tolerance Index	**SKL2. Obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms.** a. Construct an argument supported by evidence for how animals can be grouped according to their features. b. Construct an argument supported by evidence for how plants can be grouped according to their features. c. Ask questions and make observations to identify the similarities and differences of offspring to their parents and to other members of the same species.

Elementary Grades K-2	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
My Water Address, Take Action! Make an action plan Identify their water address to determine the area's water risks Identify and gather items to build an Action Emergency Pack for their home in case of a natural disaster Develop a Family Action Plan **The Thunderstorm** – model a rainfall monitoring network Mimic the sounds of a thunderstorm Monitor and record precipitation Map rainfall	**S1E1. Obtain, evaluate, and communicate weather data to identify patterns in weather and climate.** a. Represent data in tables and/or graphs to identify and describe different types of weather and the characteristics of each type. b. Ask questions to identify forms of precipitation such as rain, snow, sleet, and hailstones as either solid (ice) or liquid (water). c. Plan and carry out investigations on current weather conditions by observing, measuring with simple weather instruments (thermometer, wind vane, rain gauge), and recording weather data (temperature, precipitation, sky conditions, and weather events) in a periodic journal, on a calendar seasonally, and graphically. d. Analyze data to identify seasonal patterns of change. (Clarification statement: Examples could include temperature, rainfall/snowfall, and changes to the environment.)
Blue Planet Estimate the percentage of Earth's surface that is covered by water Predict what a probability sample will reveal about the relative coverage of land and water Estimate how long water remains in locations such as river, lakes, ground water and the ocean	**SKE2. Obtain, evaluate, and communicate information to describe the physical attributes of rocks and soils.** a. Ask questions to identify and describe earth materials—soil, rocks, water, and air. b. Construct an argument supported by evidence for how rocks can be grouped by physical attributes (size, weight, texture, color). c. Use tools to observe and record physical attributes of soil such as texture and color.
Waves and their Applications in Technologies for Information Transfer	
	S1P1. Obtain, evaluate, and communicate information to investigate light and sound. a. Use observations to construct an explanation of how light is required to make objects visible. b. Ask questions to identify and compare sources of light. c. Plan and carry out an investigation of shadows by placing objects at various points from a source of light. d. Construct an explanation to observe and provide evidence that vibrating materials can make sound and that sound can make materials vibrate. e. Design a device that can serve as an emergency alert system using light and/or sound to communicate over a distance.
Adventures in Density—conduct investigations to discover how the density of water is affected by heat and salinity, climate change, ocean heat pump Demonstrate how heat and salinity affect water density Relate the compactness of water molecules to water density in different states Recognize that concepts of density can be found in literature and daily life **Hangin' Together** – four properties of water that are critical to life on Earth Illustrate the structure and intermolecular forces of the water	**S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects**. a. Ask questions to describe and classify different substances according to their physical properties. (Clarification statement: Examples could include color, mass, length, texture, hardness, strength, absorbency, and flexibility.) b. Construct an explanation for how structures made from small pieces (linking cubes, building blocks, Legos) can be disassembled and then rearranged to make new and different structures. c. Provide evidence from observations to construct an explanation that some changes in matter caused by heating or cooling can be reversed and some changes are irreversible. (Clarification statement: Changes in matter could include heating or freezing of water, baking a cake, boiling an egg.)

Elementary Grades K-2	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
molecule in relation to hydrogen bonding Explain the role of hydrogen bonding and its relationship with some of the unique characteristics of water Deduce how these unique molecular properties of water are critical to life on Earth **Molecules in Motion** – simulate molecular movement in each of water's physical states Model the effects of heat energy on water's state of matter	
From Molecules to Organisms: Structures and Processes	
Aqua Bodies -- Identify the percentage of water in the human body List places within the human body where water is found Describe roles that water plays in the human body **Aqua Notes** -- Note the different ways the body uses water Determine that we need water **The Life Box** Identify four essential factors necessary for life Explain how living things use these four factors Recognize how these four factors work together as a system **Ocean Habitats** Explain ocean layers/zones Differentiate among marine species and compare the ocean layers in which they live Recognize that different marine species have developed special adaptations for their habitats Compare different characteristics of marine species **On Track with Hydration** – discover healthy water intake for maximum physical and mental performance Characterize hydration and the symptoms of dehydration Distinguish among activities that cause the body to lose or take in water Determine healthy hydration choices Strategize how to track daily water consumption	**S1L1. Obtain, evaluate, and communicate information about the characteristics and basic needs of plants and animals.** a. Ask questions to identify the parts of a plant—root, stem, leaf, and flower. b. Ask questions to compare and contrast the basic needs of plants (air, water, light, and nutrients) and animals (air, water, food, and shelter). c. Design a solution to ensure that a plant or animal has all of its needs met
Earth's Place in the Universe	
	S2E1. Obtain, evaluate, and communicate information about stars having different sizes and brightness. a. Ask questions to describe the physical attributes of stars—size and brightness. b. Ask questions and construct an argument that although the Sun appears to be the brightest and largest star, it is actually medium in size and brightness.

Elementary Grades 3-5	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	S4P1. Obtain, evaluate, and communicate information about the nature of light and how light interacts with objects. a. Plan and carry out investigations to observe and record how light interacts with various materials to classify them as opaque, transparent, or translucent. b. Plan and carry out investigations on the path light travels from a light source to a mirror and how it is reflected by the mirror using different angles. c. Plan and carry out an investigation utilizing everyday materials to explore examples of when light is refracted. (Clarification statement: Everyday materials could include prisms, eyeglasses, and a glass of water.)
	S4P2. Obtain, evaluate, and communicate information about how sound is produced and changed and how sound and/or light can be used to communicate. a. Plan and carry out an investigation utilizing everyday objects to produce sound and predict the effects of changing the strength or speed of vibrations. b. Design and construct a device to communicate across a distance using light and/or sound.
Biological Evolution: Unity and Diversity	
River Talk --- analyze analogies of common things to learn about watersheds Identify parts and functions of a watershed Define watershed terms Describe their local watershed Describe a watershed using analogies **Seeing Watersheds** – use maps to discover how watersheds are described and named Locate the waterway within a watershed Characterize the movement of water in a watershed based on elevation changes Discover how watersheds are named Analyze topographical maps of watershed to determine water flow **Wetland Soils in Living Color** – properties of wetland soils Classify soils according to color to confirm that an area is a wetland Summarize conditions that create the color characteristics of wetland soils	**S3L1. Obtain, evaluate, and communicate information about the similarities and differences between the habitats found within geographical regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia.** a. Ask questions to differentiate between plants and animals that live in different habitats. b. Identify external features and adaptations (camouflage, use of hibernation, protection, migration, mimicry) of animals to construct an explanation of how these features/adaptations allow them to survive in their habitat. c. Use evidence to construct an explanation of why some organisms can thrive in one habitat and not in another.
Motion and Stability: Forces and Interactions	
	S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces. a. Plan and carry out an investigation on the effects of balanced and unbalanced forces on an object and communicate the results. b. Construct an argument to support the claim that the gravitational force affects the motion of an object. c. Ask questions to identify and explain the uses of simple machines (lever, pulley, wedge, inclined plane, wheel and axle, and screw) and how forces are changed when simple machines are used to complete tasks. (Clarification statement: The use of mathematical formulas is not expected.)

Elementary Grades 3-5	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	S5P3. Obtain, evaluate, and communicate information about magnetism and its relationship to electricity. a. Construct an argument based on experimental evidence to communicate the differences in function and purpose of an electromagnet and magnet. (Clarification statement: Function is limited to understanding temporary and permanent magnetism.) b. Plan and carry out an investigation using materials (wood, paper, glass, metal, and rocks) that do or do not block magnetic force.
From Molecules to Organisms: Structures and Processes	
Macroinvertebrate Mayhem – effects for environmental stressors on Macroinvertebrate populations Illustrate how tolerance to water quality conditions varies among Macroinvertebrate organisms Explain how population diversity provides insight into the health of an ecosystem Identify environmental factors that can influence Macroinvertebrate organisms **The Life Box** Identify four essential factors necessary for life Explain how living things use these four factors Recognize how these four factors work together as a system	**S2L1. Obtain, evaluate, and communicate information about the life cycles of different living organisms.** a. Ask questions to determine the sequence of the life cycle of common animals in your area: a mammal such as a cat, dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly. b. Plan and carry out an investigation of the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time. c. Develop a simple model that depicts an animal's role in dispersing seeds or in the pollination of plants. d. Develop models to illustrate the unique and diverse life cycles of organisms other than humans.
Heredity: Inheritance and Variation of Traits	
	S5L2. Obtain, evaluate, and communicate information showing that some characteristics of organisms are inherited and other characteristics are acquired. a. Ask questions to compare and contrast the characteristics of instincts and learned behaviors. b. Ask questions to compare and contrast inherited and acquired physical traits. (Clarification statement: Punnett squares and genetics are taught in future grades.)
	S5L3. Obtain, evaluate, and communicate information to compare and contrast the parts of plant and animal cells. a. Gather evidence by utilizing technology tools to construct an explanation that plants and animals are comprised of cells too small to be seen without magnification. b. Develop a model to identify and label parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus). c. Construct an explanation that differentiates between the structure of plant and animal cells.
Biological Evolution: Unity and Diversity	
	S3E2. Obtain, evaluate, and communicate information on how fossils provide evidence of organisms that lived long ago. a. Construct an argument from observations of fossils (authentic or reproductions) to communicate how they serve as evidence of organisms and the surrounding environments of long ago. b. Develop a model to describe the sequence and conditions required for an organism to become fossilized. (Clarification statement: Types of fossils (cast, mold, trace, and true) are not addressed in this standard.)

Elementary Grades 3-5	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Water Quality? Ask the Bugs! – monitoring techniques in the classroom Define the term macroinvertebrate Describe diverse macroinvertebrates Analyze the relationship between aquatic macroinvertebrate populations and water quality Explain the process of rapid Bioassessment of aquatic macroinvertebrates Evaluate a stream's water quality using a Pollution Tolerance Index	**S5L1. Obtain, evaluate, and communicate information to group organisms using scientific classification procedures.** a. Develop a model that illustrates how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibians, reptiles, bird, and mammal) using data from multiple sources. b. Develop a model that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources.
Earth's Systems	
Blue Planet Estimate the percentage of Earth's surface that is covered by water Predict what a probability sample will reveal about the relative coverage of land and water Estimate how long water remains in locations such as river, lakes, ground water and the ocean **Blue River** – simulate the movement of water through a river and watershed Describe the major components of a watershed Demonstrate the movement of water through a river and its watershed Compare and contrast the amount of water flowing through a river and its watershed based on climate and weather Create a hydrograph base on simulation data.	**S4E4. Obtain, evaluate, and communicate information using weather charts/maps and collect weather data to predict weather events and infer weather patterns**. a. Ask questions to explain how weather instruments (thermometer, rain gauge, barometer, wind vane, and anemometer) are used in gathering weather data and making forecasts. b. Interpret data from weather maps to identify fronts (warm, cold, and stationary), temperature, and precipitation to make an informed prediction about tomorrow's weather c. Ask questions and use observations of cloud types (cirrus, stratus, and cumulus) and data of weather conditions to predict weather events and patterns throughout the year. d. Construct on explanation based on research to communicate the difference between weather and climate.
Just Passing Through – vegetation affects the movement of water over land surfaces Compare the rates at which water flows down slopes with and without plant cover Identify BMPs that can be used to reduce erosion **Rainy Day Hike** Identify the watershed in which the school is located Explain the role the school yard plays in the watershed Use research, investigation and action to reduce the amount of pollution that enters nearby rivers and likes from school property. **Get the Ground Water Picture** – create geologic cross section of Earth window Identify the parts of a ground water system Compare movement of water through diverse substrates Relate different types of land uses to potential ground water contamination **Springing into Action** Explain how water moves through diverse soil types Describe the relationship between soil types, ground water, gravity and springs	**S3E1. Obtain, evaluate, and communicate information about the physical attributes of rocks and soils.** a. Ask questions and analyze data to classify rocks by their physical attributes (shape, color, texture, luster, and hardness) using simple tests. (Clarification statement: Mohs scale should be studied at this level. Cleavage and streak as well as classification of rocks into sedimentary, igneous, and metamorphic are not addressed at this level.) b. Plan and carry out investigations to describe properties (color, texture, capacity to retain water, and ability to support growth of plants) of soils and soil types (sand, clay, loam). c. Make observations of the local environment to construct an explanation of how water and/or wind have made changes to soil and/or rocks over time. (Clarification statement: Examples could include ripples in dirt on a playground and a hole formed under gutters.)

Elementary Grades 3-5	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Recognize that water is affected by gravity and flows downhill on the surface and down-gradient under the ground Explore the cultural and historical significance of springs	
Energy	
	S5P2. Obtain, evaluate, and communicate information to investigate electricity. a. Obtain and combine information from multiple sources to explain the difference between naturally occurring electricity (static) and human-harnessed electricity. b. Design and explain all necessary components required to complete a simple electric circuit. c. Investigate and test common materials to determine if they are insulators or conductors of electricity.
Earth's Place in the Universe	
Just Passing Through – vegetation affects the movement of water over land surfaces Compare the rates at which water flows down slopes with and without plant cover Identify BMPs that can be used to reduce erosion **Rainy Day Hike** Identify the watershed in which the school is located Explain the role the school yard plays in the watershed Use research, investigation and action to reduce the amount of pollution that enters nearby rivers and likes from school property. **Storm Water** List ways that humans alter and modify the physical environment Identify how humans impact water quality List, describe and compare solutions for managing storm water runoff Explain how stormwater impacts and natural landscape and a human-made cityscape Describe how solutions that mimic nature can capture, store and filter water	**S5E1. Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.** a. Construct an argument supported by scientific evidence to identify surface features (examples could include deltas, sand dunes, mountains, volcanoes) as being caused by constructive and/or destructive processes (examples could include deposition, weathering, erosion, and impact of organisms). b. Develop simple interactive models to collect data that illustrate how changes in surface features are/were caused by constructive and/or destructive processes. c. Ask questions to obtain information on how technology is used to limit and/or predict the impact of constructive and destructive processes. (Clarification statement: Examples could include seismological studies, flood control, urban planning and construction, and beach restoration.)
Earth and Human Activity	
Common Water – simulate living near a water body that is shared resource and is managed Illustrate how multiple users of water resources can affect water quality and quantity Examine the complexities of providing water for all users **A Drop in the Bucket** – understand that this resource must be used and managed carefully Calculate the percentage of fresh water available for human use Explain why fresh water is a renewable resource **Sum of the Parts**	**S3L2. Obtain, evaluate, and communicate information about the effects of pollution (air, land, and water) and humans on the environment.** a. Ask questions to collect observations and keep records of sources and effects of pollution on the plants and animals of Georgia. b. Explore, research, and communicate solutions, such as conservation of resources and recycling materials, to protect plants and animals of Georgia.

Elementary Grades 3-5	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Differentiate between point and nonpoint source pollution Recognize that everyone contributes to and is responsible for a river or lake's water quality Identify BMPs to reduce pollution **There is no Away** – litter in waterways Describe recycling in own community Identify materials that can be recycled Identify how to reduce waste and reuse materials Demonstrate the effects of reuse, recycling, and composting on water quality in streams and ocean basins Describe how public service ad campaigns have produced measurable differences in our society	
Matter and Its Interactions	
Adventures in Density—conduct investigations to discover how the density of water is affected by heat and salinity, climate change, ocean heat pump Demonstrate how heat and salinity affect water density Relate the compactness of water molecules to water density in different states Recognize that concepts of density can be found in literature and daily life **Is There Water On Zork?** -- Describe the unique characteristics of water and design investigations to distinguish water from other clear liquids Describe qualities that distinguish water from other clear liquids Design an investigation to test characteristics of water Analyze the efficiency and effectiveness of the investigation **Molecules in Motion** – simulate molecular movement in each of water's physical states Model the effects of heat energy on water's state of matter	**S3P1. Obtain, evaluate, and communicate information about the ways heat energy is transferred and measured.** a. Ask questions to identify sources of heat energy. (Clarification statement: Examples could include sunlight, friction, and burning.) b. Plan and carry out an investigation to gather data using thermometers to produce tables and charts that illustrate the effect of sunlight on various objects. (Clarification statement: The use of both Fahrenheit and Celsius temperature scales is expected.) c. Use tools and every day materials to design and construct a device/structure that will increase/decrease the warming effects of sunlight on various materials. (Clarification statement: Conduction, convection, and radiation are taught in upper grades, and should not be taught at this grade level.)
Earth's Place in the Universe	
	S4E1. Obtain, evaluate, and communicate information to compare and contrast the physical attributes of stars, and planets. a. Ask questions to compare and contrast technological advances that have changed the amount and type of information on distant objects in the sky. b. Construct an argument on why some stars (including the Earth's sun) appear to be larger or brighter than other stars. (Clarification statement: Differences are limited to distance and size, not age or stage.) c. Construct an explanation of the difference between stars and planets in the sky. d. Evaluate strengths and limitations of models of our solar system in describing relative size, order, appearance, and composition of planets and the sun.

Elementary Grades 3-5	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	S4E2. Obtain, evaluate, and communicate information to model the effects of the position and motion of the Earth and the moon in relation to the sun as observed from the Earth. a. Develop a model to support an explanation of why the length of day and night change throughout the year. b. Develop a model based on observations to describe the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full). c. Construct an explanation of how the Earth's orbit, with its consistent tilt, affects seasonal changes.

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Matter and Its Interactions	
Adventures in Density—conduct investigations to discover how the density of water is affected by heat and salinity, climate change, ocean heat pump Demonstrate how heat and salinity affect water density Relate the compactness of water molecules to water density in different states Recognize that concepts of density can be found in literature and daily life **H2Olympics** – investigate two properties of water, adhesion and cohesion Demonstrate adhesive and cohesive properties of water Relate adhesion and cohesion to daily activities **Hangin' Together** – four properties of water that are critical to life on Earth Illustrate the structure and intermolecular forces of the water molecule in relation to hydrogen bonding Explain the role of hydrogen bonding and its relationship with some of the unique characteristics of water Deduce how these unique molecular properties of water are critical to life on Earth **Is There Water On Zork?** -- Describe the unique characteristics of water and design investigations to distinguish water from other clear liquids Describe qualities that distinguish water from other clear liquids Design an investigation to test characteristics of water Analyze the efficiency and effectiveness of the investigation **Molecules in Motion** – simulate molecular movement in each of water's physical states Model the effects of heat energy on water's state of matter	**S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.** a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures. (Clarification statement: Include heterogeneous and homogeneous; don't include types of bonds or types of compounds.) b. Develop and use models to identify the structure and properties of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed. (Clarification statement: Do not include gas laws.) c. Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical properties of matter (i.e., density, melting point, boiling point). d. Construct an argument to support the claim that when a change occurs it is either chemical or physical. (Clarification statement: Evidence could include ability to separate mixtures, development of a gas, formation of a precipitate, change in energy, color, and/or form.) e. Develop models (e.g., atomic-level models, including drawings, and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (including protons, neutrons, and electrons) and simple molecules. f. Construct an explanation based on evidence to describe conservation of matter and mass in a chemical reaction including the resulting differences between products and reactants. (Clarification statement: Evidence could include models with balanced chemical equations but students should not be expected to balance equations.)
Motion and Stability: Forces and Interactions	
	S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects. a. Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration. (Clarification statement: Students should be able to analyze motion graphs, but students should not be expected to calculate changes in velocity or acceleration.) b. Construct an explanation from evidence to describe the effects of balanced and unbalanced forces on the motion of an object (e.g., gravity, friction). c. Construct an argument from evidence to support the claim that larger objects require a greater force to accelerate (inertia).
A Snapshot in Time – topo map exploration and data collection for water quality Determine the characteristics of a watershed through topo maps Identify significant water quality parameters Differentiate between the value of data from a single sample set as compared to data from a series of sample sets Plot, graph, analyze and summarize both spatial and	**S8P5. Obtain, evaluate, and communicate information about the phenomena of gravity, electricity, and magnetism as major forces acting in nature**. a. Construct an argument using evidence to support the claim that fields (i.e., magnetic fields, gravitational fields, and electric fields) exist between objects exerting forces on each other even when the objects are not in contact. b. Plan and carry out investigations to describe the processes that cause electrostatic forces between objects. (Clarification statement: Include conduction, induction, and friction.) Plan and carry out investigations to identify factors (e.g., distance between objects, magnetic force produced by an

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
chronological trends in water quality data Write reports based on analysis Compare and contrast the effects of water quality parameters on one another	electromagnet with varying number of wire turns, varying number or size of dry cells, and varying size of iron core) that affect the strength of electric and magnetic forces. (Clarification statement: The investigations included, but are not limited to, generators or motors.)
Energy	
Adventures in Density—conduct investigations to discover how the density of water is affected by heat and salinity, climate change, ocean heat pump Demonstrate how heat and salinity affect water density Relate the compactness of water molecules to water density in different states Recognize that concepts of density can be found in literature and daily life **Hangin' Together** – four properties of water that are critical to life on Earth Illustrate the structure and intermolecular forces of the water molecule in relation to hydrogen bonding Explain the role of hydrogen bonding and its relationship with some of the unique characteristics of water Deduce how these unique molecular properties of water are critical to life on Earth **What's the Solution?** Investigate the dissolving power of water Differentiate between solutions and other mixtures Demonstrate water's ability to dissolve solids, liquids, and gases **Molecules in Motion** – simulate molecular movement in each of water's physical states Model the effects of heat energy on water's state of matter	**S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system.** a. Analyze and interpret data to create graphical displays that illustrate the relationships of kinetic energy to mass and speed and the potential energy to mass and height of an object. b. Plan and carry out an investigation to explain the transformation between kinetic and potential energy within a system (e.g., roller coasters, pendulums, rubber bands). c. Obtain, evaluate, and communicate explanations about energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)]. d. Plan and carry out investigations on the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction) or through space (radiation) or in currents in a liquid or a gas (convection).
Waves and Their Applications in Technologies for Information Transfer	
Adventures in Density—conduct investigations to discover how the density of water is affected by heat and salinity, climate change, ocean heat pump Demonstrate how heat and salinity affect water density Relate the compactness of water molecules to water density in different states Recognize that concepts of density can be found in literature and daily life	**S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.** a. Ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves. (Clarification statement: Include transverse and longitudinal waves and wave parts such as crest, trough, compressions, and rarefactions.) b. Construct an explanation using data to illustrate the relationship between the electromagnetic spectrum and energy. c. Obtain, evaluate, and communicate information to explain practical applications of the electromagnetic spectrum (e.g., communication, medical, military). d. Develop and use a model to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted, or transmitted through various materials. (Clarification statement: Include echo and how color is seen but not interference and scattering.) e. Analyze and interpret data to predict patterns in the relationship between density of media and wave behavior (i.e., speed). f. Develop and use a model (e.g., simulations, graphs, illustrations) to predict and describe the relationships between wave properties (e.g., frequency, amplitude, and wavelength) and energy. g. Develop and use models to demonstrate the effects and functions of lenses.
From Molecules to Organisms: Structures and Processes	

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
The Life Box Identify four essential factors necessary for life Explain how living things use these four factors Recognize how these four factors work together as a system	**S7L2. Obtain, evaluate, and communicate information to construct scientific explanations to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.** a. Develop a model and construct an explanation of how cell structures (specifically the nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, and mitochondria) contribute to the function of the cell as a system in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste. (Clarification statement: The intent is for students to demonstrate how the component structures of the cell interact and work together to allow the cell as a whole to carry out various processes. Additional structures, beyond those listed, will be addressed in high school Biology.) b. Develop and use a conceptual model of how cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms. c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes. (Clarification statement: The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)
Ecosystems: Interactions, Energy, and Dynamics	
Macroinvertebrate Mayhem – effects for environmental stressors on Macroinvertebrate populations Illustrate how tolerance to water quality conditions varies among Macroinvertebrate organisms Explain how population diversity provides insight into the health of an ecosystem Identify environmental factors that can influence Macroinvertebrate organisms **The Life Box** Identify four essential factors necessary for life Explain how living things use these four factors Recognize how these four factors work together as a system	**SB5. Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment**. a. Plan and carry out investigations and analyze data to support explanations about factors affecting biodiversity and populations in ecosystems. (Clarification statement: Factors include size, carrying capacity, response to limiting factors, and keystone species.) b. Develop and use models to analyze the flow of matter and energy within ecosystems through the processes of photosynthesis and respiration by • Arranging components of a food web according to energy flow. • Comparing the quantity of energy in the steps of an energy pyramid. • Explaining the need for cycling of major biochemical elements (C, O, and H). c. Construct an argument to predict the impact of environmental change on the stability of an ecosystem. d. Design a solution to reduce the negative impact of a human activity on the environment. (Clarification statement: Human activities may include climate change, population growth, chemical use, natural resources consumption, and introduction of nonnative species.) e. Construct explanations that predict an organism's ability to survive within changing environmental limits (e.g., temperature, pH, drought, fire).
Macroinvertebrate Mayhem – effects for environmental stressors on Macroinvertebrate populations Illustrate how tolerance to water quality conditions varies among Macroinvertebrate organisms Explain how population diversity provides insight into the health of an ecosystem Identify environmental factors that can influence Macroinvertebrate organisms **Ocean Habitats** Explain ocean layers/zones Differentiate among marine species and compare the ocean layers in which they live Recognize that different marine species have developed special adaptations for their habitats Compare different characteristics of marine species **Invaders!** -- Invasive water species causes habitat competition Describe how an aquatic invasive species could be transported between water bodies Identify how an aquatic invasive species can impact native species and their natural habitat	**S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments**. a. Construct an explanation to describe the patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of the ecosystem. (Clarification statement: The interactions include, but are not limited to, predator/prey relationships, competition, mutualism, parasitism, and commensalism.) b. Develop a model to describe the cycling of matter and the flow of energy among biotic and abiotic components of an ecosystem. (Clarification statement: Emphasis is on tracing movement of matter and flow of energy, not on the biochemical mechanisms of photosynthesis and cellular respiration.) c. Analyze and interpret data to provide evidence for how resource availability, disease, climate, and human activity affect individual organisms, populations, communities, and ecosystems. (Clarification statement: Limiting factors, carrying capacity, and population growth are not included.) d. Ask questions to gather and synthesize information from multiple sources to differentiate between Earth's major terrestrial biomes (i.e., tropical rain forest, savannah, temperate forest, desert, taiga, tundra, and mountain) and aquatic ecosystems (i.e., freshwater, estuaries, and marine). (Clarification statement: Emphasis is on the factors that influence patterns across biomes such as the climate, availability of food and water, temperature.)

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Discuss existing management strategies for controlling aquatic invasive species Identify at least three aquatic invasive species with own state or region	
Wetland Soils in Living Color – properties of wetland soils Classify soils according to color to confirm that an area is a wetland Summarize conditions that create the color characteristics of wetland soils **Invaders!** -- Invasive water species causes habitat competition Describe how an aquatic invasive species could be transported between water bodies Identify how an aquatic invasive species can impact native species and their natural habitat Discuss existing management strategies for controlling aquatic invasive species Identify at least three aquatic invasive species with own state or region	**S4L1. Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem**. a. Develop a model to describe the roles of producers, consumers, and decomposers in a community. (Clarification statement: Students are not expected to identify the different types of consumers – herbivores, carnivores, omnivores, and scavengers.) b. Develop simple models to illustrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers. c. Communicate a scenario to demonstrate the effect of a change on an ecosystem. (Clarification statement: Include living and non-living factors in the scenario.) d. Use printed and digital data to develop a model illustrating and describing changes to the flow of energy in an ecosystem when plants or animals become scarce, extinct, or over-abundant.
Heredity: Inheritance and Variation of Traits	
	S7L3. Obtain, evaluate, and communicate information to explain how organisms reproduce either sexually or asexually and transfer genetic information to determine the traits of their offspring. a. Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait. Science Georgia Standards of Excellence Georgia Department of Education January 14, 2016 • Page 27 of 58 b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation. (Clarification statement: The model includes, but is not limited to, the use of monohybrid Punnett squares to demonstrate the heritability of genes and the resulting genetic variation, identification of heterozygous and homozygous, and comparison of genotype vs. phenotype.) c. Ask questions to gather and synthesize information about the ways humans influence the inheritance of desired traits in organisms through selective breeding. (Clarification statement: The element specifically refers to artificial selection and the ways in which it is fundamentally different than natural selection.)
Germ Busters Identify the benefits of using soap for hand washing Identify both direct and indirect avenues of infection Recognize when it is important to wash hands List other strategies for staying healthy Perform proper hand washing techniques Sing a song that serves as a timer for healthy hand washing **Healthy Habits** -- how illness-causing bacteria and viruses can be spread by water Recognize factors that contribute to avoiding a cold or influenza Describe how some infectious diseases are spread by water or water droplets Identify ways to reduce the chances of becoming infected with a disease. **Poison Pump** – discover that water can produce negative effects for people	**S5L4. Obtain, evaluate, and communicate information about how microorganisms benefit or harm larger organisms. (Clarification statement: Possible microorganisms could include Tardigrades, Lactobacillus, Probiotics, Rotifers, Salmonella, Botox, E-coli, Algae, etc.)** a. Construct an argument using scientific evidence to support an argument that microorganisms are beneficial. b. Construct an argument using scientific evidence to support an argument that microorganisms are harmful.

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Apply investigative methods used by epidemiologists to trace the source of contagious diseases **Super Sleuths** – water borne diseases and epidemiology's role in controlling them Identify the role of water in transmitting diseases Compare symptoms of several waterborne diseases Analyze the characteristics of environments that promote the transmission of these diseases around the world **The Pucker Effect** —discover the source of contaminated drinking water Describe how underground point source pollutants move through ground water Analyze data from test wells to identify point source contamination Learn the actions that can be taken to mitigate contamination	
Earth's Place in the Universe	
	S6E2. Obtain, evaluate, and communicate information about the effects of the relative positions of the Earth, moon and sun. a. Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon. b. Construct an explanation of the alignment of the sun, Earth, and moon during solar and lunar eclipses. c. Analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight throughout the year and its effect on seasons.
	S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved. a. Ask questions to determine changes in models of Earth's position in the solar system, and origins of the universe as evidence that scientific theories change with the addition of new information. (Clarification statement: Students should consider Earth's position in geocentric and heliocentric models and the Big Bang as it describes the formation of the universe.) b. Develop a model to represent the position of the solar system in the Milky Way galaxy and in the known universe. c. Construct an explanation using a model of the interaction of gravity and inertia that governs the motion of objects in the solar system.
Earth's Systems	
Color Me a Watershed – interpret maps to observe how development can affect a watershed Recognize that population growth and settlement cause changes in land use Analyze how land use variations in a watershed can affect the runoff of water **Storm Water** List ways that humans alter and modify the physical environment Identify how humans impact water quality List, describe and compare solutions for managing storm water runoff Explain how stormwater impacts and natural landscape and a human-made cityscape Describe how solutions that mimic nature can capture, store	**S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.** a. Ask questions to compare and contrast the Earth's crust, mantle, inner and outer core, including temperature, density, thickness, and composition. b. Plan and carry out an investigation of the characteristics of minerals and how minerals contribute to rock composition. c. Construct an explanation on how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle. d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition. (Clarification statement: Environments of deposition include deltas, barrier islands, beaches, marshes, and rivers.) e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface of the Earth. f. Construct an explanation to support the claim that the movement of lithospheric plates (convergent boundary, divergent boundary, transform boundary), called plate tectonics, is due to convection currents below the lithosphere, and can cause major geologic events such as earthquakes and volcanic eruptions. g. Construct an argument using maps and data collected to describe how fossils show evidence of the changing surface and

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
and filter water **Seeing Watersheds** – use maps to discover how watersheds are described and named Locate the waterway within a watershed Characterize the movement of water in a watershed based on elevation changes Discover how watersheds are named Analyze topographical maps of watershed to determine water flow **A Snapshot in Time** – topo map exploration and data collection for water quality Determine the characteristics of a watershed through topo maps Identify significant water quality parameters Differentiate between the value of data from a single sample set as compared to data from a series of sample sets Plot, graph, analyze and summarize both spatial and chronological trends in water quality data Write reports based on analysis Compare and contrast the effects of water quality parameters on one another **Your Hydrologic Bank Account** -- hydrologic budgets for a western US watershed Identify and recognize the major deposits and withdrawals used by hydrologists to estimate a watershed's hydrologic budget	climate of the Earth. h. Plan and carry out an investigation to provide evidence that soil is composed of layers of weathered rocks and decomposed organic material
The Incredible Journey – movement of water through the water cycle Describe the movement of water within the water cycle Identify the state of water as it moves through the water cycle	**S4E3. Obtain, evaluate, and communicate information to demonstrate the water cycle**. a. Plan and carry out investigations to observe water as it changes states from solid (ice) to liquid (water) to gas (water vapor) and changes from gas to liquid to solid. b. Develop models to illustrate multiple pathways water may take during the water cycle (evaporation, condensation, and precipitation). (Clarification statement: Students should understand that the water cycle does not follow a single pathway.)
The Incredible Journey – movement of water through the water cycle Describe the movement of water within the water cycle Identify the state of water as it moves through the water cycle **Nature Rules!** – write news stories about water-related natural disasters Uncover past actions taken that influenced present-day disasters Critique newspaper reports generated by peers **The Thunderstorm** – model a rainfall monitoring network Mimic the sounds of a thunderstorm Monitor and record precipitation Map rainfall	**S6E4. Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.** a. Analyze and interpret data to compare and contrast the composition (including ozone and greenhouse gases) of Earth's atmospheric layers. b. Plan and carry out an investigation to demonstrate how energy from the sun transfers heat to the Earth (air, land and water) at different rates. (Clarification statement: Heat transfer should include the processes of conduction, convection and radiation.) c. Develop a model of the interaction between the unequal heating and the rotation of the Earth that causes local and global wind systems. d. Construct an explanation of the relationship between air pressure, fronts, and air masses and meteorological events such as tornados and thunderstorms. e. Analyze and interpret weather data to explain the contribution of moisture evaporating from the ocean as it affects weather patterns and weather events such as hurricanes.
Earth and Human Activity	
Common Water – simulate living near a water body that is shared resource and is managed	**S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.**

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Illustrate how multiple users of water resources can affect water quality and quantity Examine the complexities of providing water for all users **A Drop in the Bucket** – understand that this resource must be used and managed carefully Calculate the percentage of fresh water available for human use Explain why fresh water is a renewable resource **Money Down the Drain** Calculate the amount of water wasted by a dripping faucet Analyze the financial benefits of fixing leaking faucets **My Water Footprint** Become aware of their water footprint and daily use of water and explore how others use water to benefit them Describe product life cycles and relate them to water use Calculate daily water use for themselves, the class, and the school and estimate indirect uses Identify ways to conserve and protect water **Water Audit** Discuss water resources and water conservation concepts Predict the amount of water they will use in a 24-hour period Calculate the amount of water they use at home, both before and after the implementation of water conservation practices Calculate the amount of money save by implementing water conservation practices Provide a rationale for implementing home water conservation measures Describe the benefits of at least 5 home water conservation practices Recommend water conservation strategies to be implemented in their own homes and school	a. Construct an explanation of the sun as the major source of energy and its relationship to wind and water energy. b. Ask questions to determine the differences between renewable/sustainable (i.e., hydro, solar, wind, geothermal, tidal, and biomass) and nonrenewable energy resources (i.e., nuclear: uranium, and fossil fuels: oil, coal, and natural gas), and how they are used in our everyday lives. c. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air. d. Construct an argument of the natural processes and human factors that have caused the rise in global temperatures over the past century. (Clarification statement: Tables, graphs, and maps of global and regional temperatures, atmospheric levels of gases such as carbon dioxide and methane, and the rates of human activities should be used as sources of evidence.)
Blue Planet Estimate the percentage of Earth's surface that is covered by water Predict what a probability sample will reveal about the relative coverage of land and water Estimate how long water remains in locations such as river, lakes, ground water and the ocean **Blue River** – simulate the movement of water through a river and watershed Describe the major components of a watershed Demonstrate the movement of water through a river and its watershed Compare and contrast the amount of water flowing through a river and its watershed based on climate and weather Create a hydrograph base on simulation data. **The Incredible Journey** – movement of water through the water cycle Describe the movement of water within the water cycle Identify the state of water as it moves through the water cycle	**S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes.** a. Ask questions to determine the proportion of Earth's surface that is water (oceans, rivers, lakes, groundwater, aquifers, and ice) and communicate using a circle/pie graph the relative proportion covered by water. b. Plan and carry out an investigation to illustrate the role of the sun's energy in atmospheric conditions that lead to the cycling of water. (Clarification statement: The water cycle should include but is not limited to evaporation, condensation, precipitation, transpiration, infiltration, groundwater, and runoff.) c. Ask questions to identify and communicate using graphs and maps the composition, location, and subsurface topography of the world's oceans. d. Analyze and interpret data to create graphic representations of the causes and effects of waves, currents, and tides in Earth's systems.

MIDDLE SCHOOL – GRADES 6-8	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the evolution of living organisms through inherited characteristics. a. Use mathematical representations to evaluate explanations of how natural selection leads to changes in specific traits of populations over successive generations. (Clarification statement: Referencing data should be obtained from multiple sources including, but not limited to, existing research and simulations. Students should be able to calculate means, represent this data in a table or graph, and reference it when explaining the principles of natural selection.) b. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species. c. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, and extinction of organisms and their relationships to modern organisms. (Clarification statement: Evidence of evolution found in comparisons of current/modern organisms such as homologous structures, DNA, and fetal development are not included.)
Macroinvertebrate Mayhem – effects for environmental stressors on Macroinvertebrate populations Illustrate how tolerance to water quality conditions varies among Macroinvertebrate organisms Explain how population diversity provides insight into the health of an ecosystem Identify environmental factors that can influence Macroinvertebrate organisms **Water Quality? Ask the Bugs!** – monitoring techniques in the classroom Define the term macroinvertebrate Describe diverse macroinvertebrates Analyze the relationship between aquatic macroinvertebrate populations and water quality Explain the process of rapid Bioassessment of aquatic macroinvertebrates Evaluate a stream's water quality using a Pollution Tolerance Index	**S7L1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically.** a. Develop and defend a model that categorizes organisms based on common characteristics. b. Evaluate historical models of how organisms were classified based on physical characteristics and how that led up to the six kingdom system (currently archaea, bacteria, protists, fungi, plants, and animals). (Clarification statement: This includes common examples and characteristics such as, but not limited, to prokaryotic, eukaryotic, unicellular, multicellular, asexual reproduction, sexual reproduction, autotroph, heterotroph, and unique cell structures. Modern classification will be addressed in high school.)

HIGH SCHOOL – GRADES 9-12	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
Matter and Its Interactions	
Hangin' Together – four properties of water that are critical to life on Earth Illustrate the structure and intermolecular forces of the water molecule in relation to hydrogen bonding Explain the role of hydrogen bonding and its relationship with some of the unique characteristics of water Deduce how these unique molecular properties of water are critical to life on Earth **Molecules in Motion** – simulate molecular movement in each of water's physical states Model the effects of heat energy on water's state of matter	**SC1. Obtain, evaluate, and communicate information about the use of the modern atomic theory and periodic law to explain the characteristics of atoms and elements.** a. Evaluate the merits and limitations of different models of the atom in relation to relative size, charge, and position of protons, neutrons, and electrons in the atom. b. Construct an argument for why the proton (and not the neutron or electron) defines the element's identity. c. Construct an explanation, based on scientific evidence, of the production of elements heavier than hydrogen by nuclear fusion. d. Construct an explanation that relates the relative abundance of isotopes of a particular element to the atomic mass of the element. e. Construct an explanation of light emission and the movement of electrons to identify elements. f. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms (including atomic radii, ionization energy, and electronegativity of various elements). g. Develop and use models including electron configuration of atoms and ions to predict their chemical properties.
Adventures in Density—conduct investigations to discover how the density of water is affected by heat and salinity, climate change, ocean heat pump Demonstrate how heat and salinity affect water density Relate the compactness of water molecules to water density in different states Recognize that concepts of density can be found in literature and daily life **Hangin' Together** – four properties of water that are critical to life on Earth Illustrate the structure and intermolecular forces of the water molecule in relation to hydrogen bonding Explain the role of hydrogen bonding and its relationship with some of the unique characteristics of water Deduce how these unique molecular properties of water are critical to life on Earth	**SC2. Obtain, evaluate, and communicate information about the chemical and physical properties of matter resulting from the ability of atoms to form bonds.** a. Plan and carry out an investigation to gather evidence to compare the physical and chemical properties at the macroscopic scale to infer the strength of intermolecular and intramolecular forces. b. Construct an argument by applying principles of inter- and intra- molecular forces to identify substances based on chemical and physical properties. c. Construct an explanation about the importance of molecular-level structure in the functioning of designed materials. (Clarification statement: Examples could include why electrically conductive materials are often made of metal, flexible but durable materials are made up of long chained molecules, and pharmaceuticals are designed to interact with specific receptors.) d. Develop and use models to evaluate bonding configurations from nonpolar covalent to ionic bonding. (Clarification statement: VSEPR bonding theory is not addressed in this element.) e. Ask questions about chemical names to identify patterns in IUPAC nomenclature in order to predict chemical names for ionic (binary and ternary), acidic, and inorganic covalent compounds. f. Develop and use bonding models to predict chemical formulas including ionic (binary and ternary), acidic, and inorganic covalent compounds. g. Develop a model to illustrate the release or absorption of energy (endothermic or exothermic) from a chemical reaction system depends upon the changes in total bond energy.
What's the Solution? Investigate the dissolving power of water Differentiate between solutions and other mixtures Demonstrate water's ability to dissolve solids, liquids, and gases	**SC6. Obtain, evaluate, and communicate information about the properties that describe solutions and the nature of acids and bases.** a. Develop a model to illustrate the process of dissolving in terms of solvation versus dissociation. b. Plan and carry out an investigation to evaluate the factors that affect the rate at which a solute dissolves in a specific solvent. c. Use mathematics and computational thinking to evaluate commercial products in terms of their concentrations (i.e., molarity and percent by mass). d. Ask questions to prepare and properly label solutions of specified molar concentration. e. Develop and use a model to explain the effects of a solute on boiling point and freezing point. f. Use mathematics and computational thinking to compare, contrast, and evaluate the nature of acids and bases in terms of

HIGH SCHOOL – GRADES 9-12	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	percent dissociation, hydronium ion concentration, and pH. (Clarification statement: Emphasize conceptual understanding of pH, not mathematical.) g. Ask questions to evaluate merits and limitations of the Arrhenius and Bronsted Lowry models of acid and bases. h. Plan and carry out an investigation to explore acid-base neutralization.
From Molecules to Organisms: Structures and Processes	
	SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells. a. Construct an explanation of how cell structures and organelles (including nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi, endoplasmic reticulum, vacuoles, ribosomes, and mitochondria) interact as a system to maintain homeostasis. b. Develop and use models to explain the role of cellular reproduction (including binary fission, mitosis, and meiosis) in maintaining genetic continuity. c. Construct arguments supported by evidence to relate the structure of macromolecules (carbohydrates, proteins, lipids, and nucleic acids) to their interactions in carrying out cellular processes. (Clarification statement: The function of proteins as enzymes is limited to a conceptual understanding.) d. Plan and carry out investigations to determine the role of cellular transport (e.g., active, passive, and osmosis) in maintaining homeostasis. e. Ask questions to investigate and provide explanations about the roles of photosynthesis and respiration in the cycling of matter and energy within the cell (e.g., single celled alga). (Clarification statement: Instruction should focus on understanding the inputs, outputs, and functions of photosynthesis and respiration and the functions of the major sub-processes of each, including glycolysis, Krebs cycle, electron transport chain, light reactions, and Calvin cycle.)
	SB4. Obtain, evaluate, and communicate information to illustrate the organization of interacting systems within single-celled and multi-celled organisms. a. Construct an argument supported by scientific information to explain patterns in structures and function among clades of organisms, including the origin of eukaryotes by endosymbiosis. Clades should include: • archaea • bacteria • eukaryotes ♣ fungi ♣ plants ♣ animals (Clarification statement: This is reflective of 21st century classification schemes and nested hierarchy of clades and is intended to develop a foundation for comparing major groups of organisms.) b. Analyze and interpret data to develop models (i.e., cladograms and phylogenetic trees) based on patterns of common ancestry and evolution to determine relationships among major groups of organisms. c. Construct an argument supported by empirical evidence to compare and contrast the characteristics of viruses and organisms.
	SC3. Obtain, evaluate, and communicate information about how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions. a. Use mathematics and computational thinking to balance chemical reactions (i.e., synthesis, decomposition, single replacement, double replacement, and combustion) and construct an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. b. Plan and carry out investigations to determine indicators of a chemical reaction. (Clarification statement: Specifically precipitate formation, gas evolution, color change, water production, and changes in energy to the system should be investigated.) c. Use mathematics and computational thinking to apply concepts of the mole and Avogadro's number to conceptualize and calculate • percent composition • empirical/molecular formulas • mass, moles, and molecules relationships • molar volumes of gases

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Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	d. Use mathematics and computational thinking to identify and solve different types of reaction stoichiometry problems (i.e., mass to moles, mass to mass, moles to moles, and percent yield) using significant figures. (Clarification statement for elements c and d: Emphasis is on use of proportional relationships in the reactants and the products and on assessing students' use of mathematical thinking and is not on memorization and rote application of problem solving techniques.) e. Plan and carry out an investigation to demonstrate the conceptual principle of limiting reactants.
Ecosystems: Interactions, Energy, and Dynamics	
Back to the Future – determine safe and beneficial location for growing community though stream flow Analyze and interpret stream flow data Identify the risks and benefits of development in a floodplain	**SEV1. Obtain, evaluate, and communicate information to investigate the flow of energy and cycling of matter within an ecosystem.** a. Develop and use a model to compare and analyze the levels of biological organization including organisms, populations, communities, ecosystems, and biosphere. b. Develop and use a model based on the Laws of Thermodynamics to predict energy transfers throughout an ecosystem (food chains, food webs, and trophic levels). c. Analyze and interpret data to construct an argument of the necessity of biogeochemical cycles (hydrologic, nitrogen, phosphorus, oxygen, and carbon) to support a sustainable ecosystem. d. Ask questions to determine the relationship between the physical factors (e.g., insolation, proximity to coastline, topography) and organismal adaptations within terrestrial biomes. e. Plan and carry out an investigation of how chemical and physical properties impact aquatic biomes in Georgia. (Clarification statement: Consider the diverse aquatic ecosystems across the state such as streams, ponds, coastline, estuaries, and lakes.)
Invaders! -- Invasive water species causes habitat competition Describe how an aquatic invasive species could be transported between water bodies Identify how an aquatic invasive species can impact native species and their natural habitat Discuss existing management strategies for controlling aquatic invasive species Identify at least three aquatic invasive species with own state or region **Nature Rules!** – write news stories about water-related natural disasters Uncover past actions taken that influenced present-day disasters Critique newspaper reports generated by peers **Your Hydrologic Bank Account** -- hydrologic budgets for a western US watershed Identify and recognize the major deposits and withdrawals used by hydrologists to estimate a watershed's hydrologic budget **Make a Mural** Define the term watershed Identify their local watershed Depict the landscape, people and culture, plants and animals of their local watershed Illustrate water resource issues with in their watershed **Raining Cats and Dogs** Distinguish between figurative and literal translations of various water sayings Analyze water-related sayings from diverse cultures	**SEV2. Obtain, evaluate, and communicate information to construct explanations of stability and change in Earth's ecosystems**. a. Analyze and interpret data related to short-term and long-term natural cyclic fluctuations associated with climate change. (Clarification statement: Short-term examples include but are not limited to El Niño and volcanism. Long-term examples include but are not limited to variations in Earth's orbit such as Milankovitch cycles.) b. Analyze and interpret data to determine how changes in atmospheric chemistry (CO2 and methane) impact the greenhouse effect. c. Construct an argument to predict changes in biomass, biodiversity, and complexity within ecosystems, in terms of ecological succession. d. Construct an argument to support a claim about the value of biodiversity in ecosystem resilience including keystone, invasive, native, endemic, indicator, and endangered species.
Heredity: Inheritance and Variation of Traits	

HIGH SCHOOL – GRADES 9-12	
Project WET Activities and Objectives	**GSE – Proposed Science Standards**
	SB2. Obtain, evaluate, and communicate information to analyze how genetic information is expressed in cells. a. Construct an explanation of how the structures of DNA and RNA lead to the expression of information within the cell. (Clarification statement: The processes of replication, transcription, and translation should be addressed.) b. Construct an argument based on evidence that inheritable genetic variations may result from: • new genetic combinations through meiosis (crossing over, nondisjunction); • non-lethal errors occurring during replication (insertions, deletions, substitutions); and/or • heritable mutations caused by environmental factors (radiation, chemicals, and viruses). c. Ask questions to gather and communicate information about the use and ethical considerations of biotechnology in forensics, medicine, and agriculture. (Clarification statement: The element is intended to include advancements in technology relating to economics and society such as Genetically Modified Organisms.)
HS-LS4 Biological Evolution: Unity and Diversity	
	SB6. Obtain, evaluate, and communicate information related to the theory of evolution. a. Construct an explanation of how new understandings of the age of Earth, the emergence of new species from pre-existing species, and our understanding of genetics have influenced our understanding of biology. b. Analyze and interpret data to explain patterns in biodiversity that result from speciation (macroevolution). c. Construct an argument to support the claim that evidence from comparative morphology (analogous vs. homologous structures), embryology, biochemistry (protein sequence) and genetics support the theory that all living organisms are related by way of common descent. d. Develop and use mathematical models to support explanations of how undirected genetic changes in natural selection and genetic drift have led to changes in populations of organisms (microevolution). (Clarification statement: This element is intended to focus on basic statistical and graphic analysis. Hardy Weinberg would be an optional application to address this element.) e. Develop a model to explain the role evolution plays in causing biological resistance (e.g., pesticides, antibiotic resistance, and influenza vaccines).
	SB3. Obtain, evaluate, and communicate information to analyze how biological traits are passed on to successive generations. a. Use Mendel's laws (segregation and independent assortment) to ask questions and define problems that explain the role of meiosis in reproductive variability. b. Use mathematical models to predict and explain patterns of inheritance. (Clarification statement: Students should be able to use Punnett squares and/or rules of probability to analyze the following inheritance patterns: dominance, codominance, incomplete dominance.) c. Construct an argument to support a claim about the relative advantages and disadvantages of sexual and asexual reproduction for a population.
Earth's Place in the Universe	
A Snapshot in Time – topo map exploration and data collection for water quality Determine the characteristics of a watershed through topo maps Identify significant water quality parameters Differentiate between the value of data from a single sample set as compared to data from a series of sample sets Plot, graph, analyze and summarize both spatial and chronological trends in water quality data Write reports based on analysis Compare and contrast the effects of water quality parameters on one another	**SES4. Obtain, evaluate, and communicate information to understand how rock relationships and fossils are used to reconstruct the Earth's past.** a. Use mathematics and computational thinking to calculate the absolute age of rocks using a variety of methods (e.g., radiometric dating, ice cores, and tree rings). b. Construct an argument applying principles of relative age (superposition, original horizontality, cross-cutting relations, and original lateral continuity) to interpret a geologic cross-section and describe how unconformities form. c. Analyze and interpret data from rock and fossil succession in a rock sequence to interpret major events in Earth's history such as mass extinction, major climatic change, and tectonic events. d. Construct an explanation applying the principle of uniformitarianism to show the relationship between sedimentary rocks and their fossils to the environments in which they were formed.

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	e. Construct an argument using spatial representations of Earth data that interprets major transitions in Earth's history from the fossil and rock record of geologically defined areas. (Clarification statement: Students should use maps and cross-sections with a focus on Georgia.)
Earth's Systems	
Humpty Dumpty – environmental restoration projects Describe the challenges of restoring an altered natural environment Develop a restoration plan for a local site **Nature Rules!** – write news stories about water-related natural disasters Uncover past actions taken that influenced present-day disasters Critique newspaper reports generated by peers **Rainy Day Hike** Identify the watershed in which the school is located Explain the role the school yard plays in the watershed Use research, investigation and action to reduce the amount of pollution that enters nearby rivers and likes from school property. **A Snapshot in Time** – topo map exploration and data collection for water quality Determine the characteristics of a watershed through topo maps Identify significant water quality parameters Differentiate between the value of data from a single sample set as compared to data from a series of sample sets Plot, graph, analyze and summarize both spatial and chronological trends in water quality data Write reports based on analysis Compare and contrast the effects of water quality parameters on one another	**SES3. Obtain, evaluate, and communicate information to explore the actions of water, wind, ice, and gravity as they relate to landscape change.** a. Plan and carry out an investigation that demonstrates how surface water and groundwater act as the major agents of physical and chemical weathering. b. Develop a model of the processes and geologic hazards that result from both sudden and gradual mass wasting. c. Construct an explanation that relates the past and present actions of ice, wind, and water to landform distribution and landscape change. d. Construct an argument based on evidence that relates the characteristics of the sedimentary materials to the energy by which they were transported and deposited.
	SES2. Obtain, evaluate, and communicate information to understand how plate tectonics creates certain geologic features, landforms, Earth materials, and geologic hazards. a. Construct an explanation that describes radioactive decay as the source of energy that drives plate tectonics through the process of convection. b. Develop and use models for the different types of plate tectonic settings (convergent, divergent, and transform boundaries). (Clarification statement: Include subduction zones, continental collisions, rift zones, and ocean basins.) c. Construct an explanation that communicates the relationship of geologic features, landforms, Earth materials, and geologic hazards to each plate tectonic setting. d. Ask questions to compare and contrast the relationship between transformation of all rock types (sedimentary, igneous, and metaphoric) and specific plate tectonic settings. e. Construct an argument using multiple forms of evidence that supports the theory of plate tectonics (e.g., fossils, paleomagnetism, and seafloor age).
	SES1. Obtain, evaluate, and communicate information to investigate the composition and formation of Earth systems, including the Earth's place in the solar system. a. Construct an explanation of the origins of the solar system from scientific evidence including the composition, distribution and motion of solar system objects. (Clarification statement: Include the nebular hypothesis in this element.) b. Ask questions to evaluate evidence for the development and composition of Earth's early systems, including the geosphere (crust, mantle, and core), hydrosphere, and atmosphere. (Clarification statement: Include differentiation by density of Earth

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	into crust, mantle, and core in this element.) c. Develop a model of the physical composition of Earth's layers using multiple types of evidence (e.g., Earth's magnetic field, composition of meteorites and seismic waves). (Clarification statement: Earth's layers include crust, mantle, inner core and outer core.)
Earth and Human Activity	
Get the Ground Water Picture – create geologic cross section of Earth window Identify the parts of a ground water system Compare movement of water through diverse substrates Relate different types of land uses to potential ground water contamination **A-Maze-ing Water** – create a model of drainage pipes to learn how activities affect water quality Describe urban forms of pollution Provide reasons why people should monitor what they put on their lawns or in the streets Identify ways to treat urban runoff **Color Me a Watershed** – interpret maps to observe how development can affect a watershed Recognize that population growth and settlement cause changes in land use Analyze how land use variations in a watershed can affect the runoff of water **Common Water** – simulate living near a water body that is shared resource and is managed Illustrate how multiple users of water resources can affect water quality and quantity Examine the complexities of providing water for all users **A Drop in the Bucket** – understand that this resource must be used and managed carefully Calculate the percentage of fresh water available for human use Explain why fresh water is a renewable resource **Sum of the Parts** Differentiate between point and nonpoint source pollution Recognize that everyone contributes to and is responsible for a river or lake's water quality Identify BMPs to reduce pollution **Macroinvertebrate Mayhem** – effects for environmental stressors on Macroinvertebrate populations Illustrate how tolerance to water quality conditions varies among Macroinvertebrate organisms Explain how population diversity provides insight into the health of an ecosystem Identify environmental factors that can influence Macroinvertebrate organisms	**SEV4. Obtain, evaluate, and communicate information to analyze human impact on natural resources.** a. Construct an argument from evidence on the effects of human activities on natural resources b. Design and defend solutions to reduce detrimental human impact on the environment including, but not limited to, smog, ozone depletion, land and sea temperature changes, and ocean acidification. c. Construct an argument to evaluate how human population growth affects food demand and food supply (GMOs, monocultures, desertification, Green Revolution) including types, availability, use, pollution, sustainability, and conservation of natural resources.
	SEV3. Obtain, evaluate, and communicate information to evaluate types, availability, allocation, and sustainability of energy resources. a. Analyze and interpret data to communicate information on the origin and consumption of renewable forms of energy (wind,

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	solar, geothermal, biofuel, and tidal) and non-renewable energy sources (fossil fuels and nuclear energy). b. Construct an argument based on data about the risks and benefits of renewable and nonrenewable energy sources. (Clarification statement: This may include, but is not limited to, the environmental, social, and economic risks and benefits.) c. Obtain, evaluate, and communicate data to predict the sustainability potential of renewable and non-renewable energy resources. d. Design and defend a sustainable energy plan based on scientific principles for a specific location. e. Develop and use models of the relationship between energy availability and the growth of the human population to predict future changes in human populations.
Color Me a Watershed – interpret maps to observe how development can affect a watershed Recognize that population growth and settlement cause changes in land use Analyze how land use variations in a watershed can affect the runoff of water **Humpty Dumpty** – environmental restoration projects Describe the challenges of restoring an altered natural environment Develop a restoration plan for a local site **Nature Rules!** – write news stories about water-related natural disasters Uncover past actions taken that influenced present-day disasters Critique newspaper reports generated by peers **A Snapshot in Time** – topo map exploration and data collection for water quality Determine the characteristics of a watershed through topo maps Identify significant water quality parameters Differentiate between the value of data from a single sample set as compared to data from a series of sample sets Plot, graph, analyze and summarize both spatial and chronological trends in water quality data Write reports based on analysis Compare and contrast the effects of water quality parameters on one another **Snow and Tell** – model of snow pack runoff Describe snowpack and its role in a watershed Describe the factors that affect snowpack runoff Measure snow water equivalency Discuss the importance of studying snow **Storm Water** List ways that humans alter and modify the physical environment Identify how humans impact water quality List, describe and compare solutions for managing storm water runoff Explain how stormwater impacts and natural landscape and a human-made cityscape Describe how solutions that mimic nature can capture, store and filter water **Your Hydrologic Bank Account** -- hydrologic budgets for a western US watershed Identify and recognize the major deposits and withdrawals used	**SES6. Obtain, evaluate, and communicate information about how life on Earth responds to and shapes Earth's systems.** a. Construct an argument from evidence that describes how life has responded to major events in Earth's history (e.g., major climatic change, tectonic events) through extinction, migration, and/or adaptation. b. Construct an explanation that describes how biological processes have caused major changes in Earth's systems through geologic time (e.g., nutrient cycling, atmospheric composition, and soil formation). c. Ask questions to investigate and communicate how humans depend on Earth's land and water resources, which are distributed unevenly around the planet as a result of past geological and environmental processes. d. Analyze and interpret data that relates changes in global climate to natural and anthropogenic modification of Earth's atmosphere and oceans.

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by hydrologists to estimate a watershed's hydrologic budget	
High Water History – the economic and social cost of flooding Interpret how economic damage reports present individual and community losses from a natural disaster Differentiate between emotional and economic loss from a natural disaster Recognize why some natural events are classified as disasters Describe what it means to live in a floodplain **The Incredible Journey** – movement of water through the water cycle Describe the movement of water within the water cycle Identify the state of water as it moves through the water cycle **Nature Rules!** – write news stories about water-related natural disasters Uncover past actions taken that influenced present-day disasters Critique newspaper reports generated by peers **The Thunderstorm** – model a rainfall monitoring network Mimic the sounds of a thunderstorm Monitor and record precipitation Map rainfall	**SES5. Obtain, evaluate and communicate information to investigate the interaction of solar energy and Earth's systems to produce weather and climate.** a. Develop and use models to explain how latitudinal variations in solar heating create differences in air pressure, global wind patterns, and ocean currents that redistribute heat globally. b. Analyze and interpret data (e.g., maps, meteograms, and weather apps) that demonstrate how the interaction and movement of air masses creates weather. c. Construct an argument that predicts weather patterns based on interactions among ocean currents, air masses, and topography. d. Analyze and interpret data to show how temperature and precipitation produce the pattern of climate regions (zones) on Earth. e. Construct an explanation that describes the conditions that generate extreme weather events (e.g., hurricanes, tornadoes, and thunderstorms) and the hazards associated with these events. f. Construct an argument relating changes in global climate to variation to Earth/sun relationships and atmospheric composition.
Get the Ground Water Picture – create geologic cross section of Earth window Identify the parts of a ground water system Compare movement of water through diverse substrates Relate different types of land uses to potential ground water contamination **Color Me a Watershed** – interpret maps to observe how development can affect a watershed Recognize that population growth and settlement cause changes in land use Analyze how land use variations in a watershed can affect the runoff of water **Common Water** – simulate living near a water body that is shared resource and is managed Illustrate how multiple users of water resources can affect water quality and quantity Examine the complexities of providing water for all users **A Grave Mistake** Analyze data to trace the flow of contaminants in ground water Conclude that past solutions, developed with the best of intentions, may create contemporary problems **High Water History** – the economic and social cost of flooding Interpret how economic damage reports present individual and community losses from a natural disaster Differentiate between emotional and economic loss from a natural disaster Recognize why some natural events are classified as disasters Describe what it means to live in a floodplain	**SEV5. Obtain, evaluate, and communicate information about the effects of human population growth on global ecosystems.** a. Construct explanations about the relationship between the quality of life and human impact on the environment in terms of population growth, education, and gross national product. b. Analyze and interpret data on global patterns of population growth (fertility and mortality rates) and demographic transitions in developing and developed countries. c. Construct an argument from evidence regarding the ecological effects of human innovations (Agricultural, Industrial, Medical, and Technological Revolutions) on global ecosystems. d. Design and defend a sustainability plan to reduce individual contributions to environmental impacts, taking into account how market forces and societal demands (including political, legal, social, and economic) influence personal choices.

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Project WET Activities and Objectives	**GSE – Proposed Science Standards**
The Long Haul Develop an awareness of various volumes of water Appreciate the readily available water supplies in the developed world Understand how easy access to water can encourage people to use large amounts of water	

Project WET Activities, interdisciplinary, not fitting with Science Standards:
The Long Haul
Develop an awareness of various volumes of water
Appreciate the readily available water supplies in the developed world
Understand how easy access to water can encourage people to use large amounts of water
Virtual Water – interdependence among water users, producers and people world-wide
Distinguish between direct and indirect uses of water
Illustrate the interconnectedness of water users in a community
Demonstrate the complexity of resolving water shortages among interdependent community water users
8-4-1, One For All
Identify water users and their water use or product
Describe major water user categories and how each consumes water
Demonstrate the complexity of sharing water among all water users in a watershed
Summarize how water managers use adaptive and integrated strategies to address river basin water challenges
Hitting the Mark
Distinguish between accuracy and precision
Investigate the relationship of accuracy and precision as it relates to water quality data collection
Develop and write clear procedures and communicate the limitations of those procedures
The Price is Right – building a water development project
Calculate the costs involved in supplying clean water to consumers and removing wastewater
Recognize that cost and environmental considerations influence the planning and construction of water projects
Reaching Your Limits –water quality standards
Describe the relationship between water quality and water treatment
Recognize the ratio of one to a million and one to a billion
Super Bowl Surge – wastewater treatment systems
Illustrate how demands on some treatment plants cause overflow
Explain problems with sewage overflow
Generate solutions to a water management problem
Recognize how presentation strategies influence public policy
Urban Waters – urban water cycle and workplace professionals
Explain the major components of the urban water cycle
Describe various water resource careers
Sequence water-related occupations involved in the urban water cycle
Pass the Jug – water rights
Describe historical and current aspects of water rights
Illustrate how water rights are used to allocate water
Evaluate water rights allocation systems
Water Crossings – engineering a floating platform
Analyze the influence of river crossings on settlement patterns
Describe the water-related transportation problems that faced early explorers and settlers
Design and build water-crossing conveyances
Discover the Waters of our National Parks
Define what a national park is

Describe why national parks are characterized as a uniquely American idea
Locate national parks on a US map
Identify unique water features of diverse national parks

The Rainstick

Relate the sound produced by an instrument to the type and quantity of materials used in its construction
Recognize how other cultures create rainsticks from materials found within their environments
Imitate the sound of rain with various materials

Water Inspirations

Identify and describe the three state of water
Apply several writing techniques to produce poems or other creative writing
Analyze a poem and literary passage in which water is the main character
Interpret diverse poems to discover how water images can be used in poetry