Course: Natural/Physical Science
Instructor: Carolyn Wright

Unit	Time Frame	Learning Target(s)/Objective(s)	Standards	Vocabulary	Assessments	Program Materials/ Resources
Equipment, Native Species, Invasive Species ID	Daily at the start of class	Identify the equipment, commonly used in the Environmental/Natural Resources/Forestry/Maple Industries; Describe the function of each tool or piece of equipment; Identify invasive species common in the Northeast.	ESS.01.02.02.a. Identify basic environmental monitoring instruments and explain their uses. NRS.01.02.03.a. Research and examine the characteristics used to identify wildlife and insects. NRS.01.02.03.b. Apply identification techniques to determine the species of wildlife or insect. NRS.04.03.02.a. Identify and classify invasive species common to a particular region.	Refractometer, Secchi disk, water meter for physical/chemical parameters (pH, conductivity, DO), Bottom Dredges, Fish Measuring Board, Plankton Net, Seines, Sieves, Animal tags/bands, Mammal traps, Snake/Reptile Stick, Radio Telemetry Unit, Wind speed meters, Barometer, Abny level, Push Probe, Soil Auger, Soil Color Book, Armadillo, Badger, Beaver, Bighorn sheep, Bison, Black bear, Balcktail deer, Bobcat, Chipmunk, Cottontail, Coyote, Elk, Fox Squirrel, Gray Squirrel, Gray Wolf, Grizzly Bear, Jack Rabbit, Mole, Moose, Mountain Goat, Mountain Lion, Mule Deer, Muskrat, Opossum, Pocket Gopher, Porcupine, Prairie Dog, Pronghorn, Raccoon, Red Fox, Skunk, Weasel, Whitetail Deer, Woodchuck, Bald eagle, Blue Jay, Bluebird, Brown Thrasher, Canada goose, Canvasback Duck, Cardinal, Cooper's Hawk, Crissal Thrasher, Mourning dove, Great blue heron, Great Horned Owl, Golden Eagle, Hummingbird, Kestrel, Least tern, Mallard duck, Osprey, Pelican, Purple Martin, Quail, Red-tailed Hawk, Sand Hill Crane, Blue-Winged teal, Turkey, Whooping Crane, Wood Duck, Alligator, Alligator Snapping Turtle, Black rat snake, Bullfrog, Collared Lizard, Common Snapping Turtle, Copperhead Snake, Coral Snake, Corn Snake, Cottonmouth, Crocodile, Fence Lizard, Garter Snake, Green Anole Lizard, Gray Tree Frog, Rattlesnake, Red Eared Slider, Rink Neck Snake, Rubber Boa Snake, Scarlet King Snake, Woodhouse's Toad, Blue Catfish, Bream/Bluegill, Brown Trout, Carp, Channel Catfish, Clam, Crab, Crappie, Crayfish, Flathead Catfish, Largemouth Bass, Lobster, Salmon, Shrimp, Smallmouth Bass, Strugeon, Trout, Walleye, Yellow Bullhead Catfish, Broom Snake weed, Cheatgrass, Chinese tallow, Cogon grass, English Ivy, Himalaya blackberry, Hydrilla, Juniper, Kudzu, Leafy Spurge, Melaleuca, Mimosa Tree, Purple Loosestrife, Russian Olive, Saltcedar, Asiatic clam, Asian long-horned beetle, Chinese mitten crab, Chukkar, English Sparrow, European Starling, Feral hog, Feral Horses, Fire ant, Gopher, Norway Rat, Nutria, Ring Neck Pheasant, Sea Lamprey, Tilapia, Zebra Mussel, Altimeter, Angle gauge, Ascender, Automatic level, Backpack fire pump, Bark	Quizzes after every 20 Daily Flashcards	Physical Tools, Pictures of animals and plants, Paper, Pencil
Tragedy of the Commons	September	Describe the significance of the Tradegy of the Commons and how it relates to our natural resources.		Natural Resources, Common Resources, Local Commons, Global Commons	Happy Fishing Lab	Gold Fish, Spoons, Lab Wkst

Historical Perspectives of Natural Resources & Conservation	September	Identify and discuss the significance of important historical events related to natural resources; Critique how key figures in history changed our perceptions and conversations about natural resources; Explain legislation and governmental organizations that enable us to be good stewards of our natural resources; Identify and define the mission of environmental advocacy organization	NRS.01.01.01.c. Devise strategies for the preservation of natural resources based on their classification. NRS.02.01. Examine and interpret the purpose, enforcement, impact and effectiveness of laws and agencies related to natural resource management, protection, enhancement and improvement (e.g., water regulations, game laws, historic preservation laws, environmental policy, etc.). NRS.02.01.01.a. Distinguish between the types of laws associated with natural resources systems. NRS.02.01.02.c. Evaluate the impact and effectiveness of agencies associated with natural resources systems (e.g., regulation of consumption, prevention of damage to natural resources systems, management of ecological interactions, etc.). NRS.02.03.02.a. Research and assess how historical figures played a prominent role in shaping how natural resources are viewed and used today (e.g., Aldo Leopold, Teddy Roosevelt, John Muir, Rachel Carson, Gaylord Nelson, etc.). NRS.02.03.02.b. Examine and describe	Bioaccumulate, Conservation ethic, Conservation Movement, DDT, Dispersant, Dust Bowl, Earth Day, Industrial Revolution, Land ethic, Natural Disaster, Progressive Era, Smog, Synthetic Pesticide, Conservation, Conservationist, Environmental Stewardship, Preservation, Preservationist	Historical Figure Role Play	iPad, Historical Conservationist/ Preservationsit Cards
Dichotomous Keys	September	Apply understanding of leaf, twig, and bud terminology to properly utilize a dichotomous key to identify tree samples.	NRS.01.02.01.b. Apply identification techniques to determine the species of a tree or woody plant.	Dichotomous Key, Twig Arragangement- alternate, opposite, zigzag, Size- stout, slender, Pith- chamber, solid, star, Buds- terminal, not terminal, lateral, clustered, Bud Scales, Needle-like leaves (Coniferous), Broadleaf (Deciduous Trees)	Dichotomous Key Lab	Tree samples, *Know Your Tree* books
Parts of a Leaf	September	Identify the parts of a leaf, Describe the purpose of each leaf part, Describe the different types of leaves.	NRS.01.02.01.b. Apply identification techniques to determine the species of a tree or woody plant. PS.02.02.04.a. Research and summarize leaf morphology and the functions of leaves.	Apex, Veins, Midrib, Base, Leaf Blade (Lamina), Petiole, Stipule, Axil, Simple leaf, Compound leaf, Twice Compound Leaf, Opposite, Alternate, Leaf Margin- entire, serate, doubly serate, toothed, lobed, clefts, Pinnate, Palmate, Shape- ovate, heart, linear, triangular, lanceolate, Base- oblique, rounded, square, Apex- blunt, sharp, truncate	Leaf Press Project	Plywood, Cardboard, Bolts
Tree ID	Sept./Oct.	Identify common trees found in the Northeast based on leaves, fruit, and bark.	NRS.01.02.01.b. Apply identification techniques to determine the species of a tree or woody plant.	Red Alder, Ash, Bigtooth Aspen, Quaking Aspen, Baldcypress, American Beech, Black Birch, White Birch, Black Cherry, Eastern Cottonwood, Elm, Balsam Fir, Douglas Fir, Eastern Hemlock, Western Hemlock, Hickory, Red Maple, Sugar Maple, Black Oak, Chestnut Oak, Norther Red Oak, Scarlet Oak, Southern Red Oak, White Oak, Pecan, Eastern White Pine, Loblolly Pine, Lodgepole Pine, Longleaf Pine, Pitch Pine, Ponderosa Pine, Red Pine, Shortleaf Pine, Yellow Poplar, Western Red Cedar, Eastern Red Cedar, Red Spruce, Sitka Spruce, White Spruce, Sweetgum, Sycamore, Black Walnut	Tree ID book	Flagging Tape, *Know Your Trees* books, Leaf Press, Paper, Pens/Pencils

Dendrology/ Dendrochronology/ Internal Tree Anatomy/Hardwoods & Softwoods/ North American Forestry Regions/ Commercially Important Trees	Filler topics for bad weather days between Sept.-Nov.	Identify the major North American Forestry Regions; Identify major species of trees of economic importance to the United States and internationally, Identify the internal anatomy of a tree, Determine the ages of trees based on knowledge of growth rings, Describe the significance of dendrochronology to the forestry industry	NRS.02.04.02.b. Assess the importance of the use of natural resources on local, state and national economies. PS.02.02.03.a. Identify and summarize the components and the functions of plant stems.	Hardwood, Softwood, DEC stump report, Dendrochronology, Tree (Growth) Rings, Cambium, Dead bark, Sapwood (Xylem), Heartwood, Live bark, Pith, Medullary rays	Tree Cookies, Tree Growth Lab, Hardwood & Softwood Project, Current Event	Hardwood, Softwood, Cross Sections of tree, handsaws, paint, craft supplies
Orienteering	October	Identify parts of a compass, Describe the purpose of each compass part, Explain the navigational purpose of a compass, Demostrate proper utilization of a compass to navigate and determine bearing.	ESS.01.01.01.c. Collect and prepare sample measurements using appropriate data collection techniques. ESS.05.01.01.c. Demonstrate surveying and cartographic skills to make site measurements in order to address concerns and needs within an environmental service systems situation.	Compass, Base plate, Compass Dial, Direction of Travel Arrow, Orienteering Arrow, Magnetic Needle, Orienteering Lines, Ruler (in inches), Bearing, Pace, Azimuth readings	Measuring Pace; Basic Compass Parts; Finding Direction, Following Direction, Finding Object's Bearing (Obstacle Course)	Compass, Measuring Tape
Topographic Maps	October	Demonstrate how to orient a compass on a topographic map, Interpret a topographic map.	ESS.05.01.01.c. Demonstrate surveying and cartographic skills to make site measurements in order to address concerns and needs within an environmental service systems situation. NRS.03.02.01.a. Summarize how to use maps to identify directions and land features, calculate actual distance and determine the elevations of points.	Topographic Map, Legal description, Parcel, Map Symbols- Contours, Boundaries, Land Survey Systems, Surface Features, Vegetation, Rivers/Lakes/Canals, Buildings/Roads, Transmission Lines/Pipelines	Topographic Map Lab	Compass, Topographic Map
Tree Diameter & Height	October/November	Demonstrate proper use of a Biltmore Stick, Perform a forest inventory, Discuss reasons for Timber Cruising	ESS.01.01.01.c. Collect and prepare sample measurements using appropriate data collection techniques. NRS.01.02.06.c. Conduct an assessment of the resource inventories or population in a given area.	Biltmore Stick, Doyle Scale, Timber Cruising, DBH, Merchantable Height, Circumference, Diameter, Board Foot Volume	Build a Biltmore Stick; Timber Cruising- board foot estimation lab; Assess which Maples are appropriate Tapping Size	Biltmore Sticks, Calculator, Diameter Tapes

Timber Stand Improvement: Harvest, Deaden, & Leave	November	Perform a forest management evaluation.; Describe the stages of forest succession and their relative mgmt practices; Analyze a forest industry scenario and make recommendations based on economic principles and concepts of management.	ABS.01.01.01.c. Create strategies to maximize the efficiency of AFNR business inputs and outputs using microeconomic principles. ABS.01.02.02.c. Evaluate AFNR business goals and objectives, then make revisions based on data and observations. ABS.04.02.01.c. Make recommendations to improve operational plans for an AFNR business based on best practices. CS.04.01.01.b. Analyze available practices to steward natural resources in AFNR systems (e.g., wildlife and land conservation, soil and water practices, ecosystem management, etc.). NRS.04.01.02.c. Create a timber stand improvement plan for a forest.	Harvest, Deaden, Leave, Forest Succession, Stand Initiation, Stem Exclusion, Understory Reinitiation, Steady State, Stumpage Cost, Profit/Loss, Cost of Operation, Depreciation	Scenario Recommendation Presentation (Group), Current Event	Marked Wooded Area, Biltmore Sticks, Record Sheet, Scenario
Chainsaws-Parts, Troubleshooting & Safety	Nov./Dec.	Identify the external parts of a chainsaw, Describe proper ppe and safety protocol for operating a chainsaw, Identify safety hazards, unsafe practices, and proper safety equipment	CS.03.04.01.a. Identify and differentiate the appropriate protective equipment for the safe use and operation of specific tools. CS.03.04.02.a. Identify standard tools, equipment and safety procedures related to AFNR tasks. CS.03.04.03.b. Assess and demonstrate appropriate operation, storage and maintenance techniques for AFNR tools and equipment. PST.01.02.03.c. Conduct a safety inspection of tools, machines and equipment used in different AFNR related mechanical systems.	Sawchain, (Guide) Bar, Muffler, Oil Cap, Oil Reservoir, Housing, Fuel Cap, Fuel Tank, Trigger, Rear hand guard, Safety Switch, Throttle Control Lever, Protective Case, Air Filter Cover, Starting Pull Handle, Front Handle, Front Hand Guard, Chain Brake	Cardboard Chainsaw	Cardboard, Glue, Markers, Scissors, Utility Knives
Wildfires	Dec./Jan.	Identify the anatomy of a wilfire, Demonstrate and Explain the effect topography has on wildfire spread, Create an ecosystem that is impacted by fire	NRS.04.04.01.b. Assess techniques used to fight wildfires, manage prescribed fires and ensure human safety.	Fire Triangle, Fire Anatomy- Spot Fire, Finger, Head, Right/Left Flank, Heal or Rear, Wind Direction, Point of Origin, Bay	Wildfire Lab; Famous Fires; Create Ecosystem impacted by Fire; Current Event	Toothpicks, Drywall, Matches, Foil Pans, Craft Supplies, Natural Elements

Forest Products	December	Discuss the economic advantages and disadvantages of developing added value products; Describe the economic importance of Christmas trees, Explain the advantages and disadvantages of real vs artificial trees	NRS.02.04.01.a. Compare and contrast how the economic value of a natural resource affects its availability. CS.01.01.02.c. Evaluate emerging trends and the opportunities they may create within the AFNR systems. ABS.05.01.01.c. Evaluate and predict future trends for a specific AFNR product as related to markets, trade and price (e.g., corn, oil, wheat, etc.).	Added Value Products, Artificial Trees, Real Trees	Wreath/Swags, Cutting Boards	Wood, Shop Tools, Engraving Knives, Pine boughs, Ribbons, Accessories, Hand Tools
Maple Production	Feb./March	Describe the conditions under which maple syrup can be produced; Explain tapping techniques, guidelines, and skills used in the industry; Explain production techniques in NY approved by the IMSI/NAMSC, NYSMPA and the Cornell Maple Research Team; State the correct point where syrup becomes syrup	NRS.01.03.02.a. Research and summarize how climate factors influence natural resource systems.FPP.02.02.01.a. Examine and describe the basic chemical makeup of different types of food. FPP.03.01.01.a. Summarize characteristics of quality and yield grades of food products. FPP.03.01.01.b. Analyze factors that affect quality and yield grades of food products.	Dropline, Lateral Line, Mainline, Maple Sap, Natural Vacuum, Open taphole, Reaming, Retapping, Reverse Osmosis, Saddle Fitting, Sap, Sap Bag, Sap Bucket, Sap Flow Mechanism, Spout/Spile, Taphole, Taphole closure, Tapping, Tubing, Baume Scale, Blow test, Apron test, Arch, Automatic Draw-off, Back pan, Brix Scale, Continuous Flow Evaporator, Defoamer, Density, Drop Flue, Evaporator, Finished Syrup, Flat bottom pan, Finishing pan, Flavor, Flue, Niter/Sugar Sand, STEAM-AWAY	PBL Lab Data Collection, Current Event, PBL Lab Report*	Woodlot, Sap Buckets, Spouts, Drill, Tubing, Spouts Hammer, iPad/Computer
Consumer Waste/Garbage Unit PBL	January	Describe different methods for handling garbage generated by humans; Identify problems associated with waste generated by humans; Quantity how much waste you generate in your personal life; Explain the lifecycle of a product you use; Create something innovative by upcycling a piece of trash.	ESS.04. Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).	Composting, Upcycling, Garbage, Pollution	Composting, Personal Waste Audit, Lifecycle of a Product Project, Upcycling Project	iPad
Carbon Cycle & Climate Change	April	Identify and explain the biogeochemical cycles; Create models of the water, nitrogen, and carbon cycles; Identify and explain the major components of the hydrologic cycle; List and Explain the three natural forms of water; Determine the difference between atmospheric water, groundwater, and surface water and provide examples of each; Define and explain the importance of a watershed; Identify types of water rights and discuss how they are employed in dfferent areas of the U.S.; Distinguish different types of water-holding locations	NRS.01.03.01.a. Classify different kinds of biogeochemical cycles and the role they play in natural resources systems. NRS.01.03.01.b. Assess the role that the atmosphere plays in the regulation of biogeochemical cycles. NRS.01.03.01.c. Evaluate and make recommendations to lessen the impact of human activity on the ability of the atmosphere to regulate biogeochemical cycles. NRS.01.04.01.a. Summarize the roles and properties of watersheds. NRS.01.04.01.b. Assess the function of watersheds and their effect on natural resources. NRS.01.04.01.c. Evaluate and defend the importance of watersheds to ecosystem function.	Carbon Cycle, Nitrogen Cycle, Carbon Pool, Carbon Sink, Carbon Source, Hydrologic (Water) Cycle, Fixation, Legumes, Ammonification, Nitrification, Nitrates, Denitrification, Transpiration, Condensation, Precipitation, Groundwater, Evaporation, Surface Runoff, Storage, Source, Springs, Headwaters, Mouth, Estuaries, Welands- tidal and nontidal, Brackish Water, Accumulation, Aquifer, Atmospheric water, Bog, Brook, Channel, Confined Aquifer, Creek, Embeddedness, Fen, Forest Swamp, Hydrology, Infiltration, In-stream water rights, Kill, Liquid water, Marsh, Ocean, Pond, Pool, Prior appropriation water rights, Riffle, Riparian water rights, River, Run, Sea, Shrub Swamp, Snow Cover, Solid Water, Strait, Stream, Surface Water, Transpiration, Unconfined aquifer, Water rights, water vapor, Watershed	Personal Carbon Footprint Calculation, Ocean Acidification Lab	iPad, Sea Shells, Vinegar, Calcium Chloride, Sodium Bicarbonate, Plastic Cups & Spoons, Water, Pipette

Water Quality & Testing/Pollution	April	Identify natural and anthropogenic sources of pollution and how their effect on the environment differs; Analyze water chemistry principles; Determine the different uses of water; Identify contaminants that impact water quality; Explain how biomagnification impacts species; List bioindicators and explain their importance in the ecosystems; Determine the general composition of air; Identify types of contamination that are found in air; Descirbe the origin of each type of pollution; Explain the concept of airsheds; Identify organization and legislation that control and study air quality	NRS.01.03. Apply ecological concepts and principles to atmospheric natural resource systems. NRS.01.04.02.a. Examine and describe the importance of groundwater and surface water to natural resources. NRS.01.04.02.c. Devise and apply strategies to manage, protect, enhance or improve sources of groundwater or surface water based on its properties. NRS.01.04.03.a. Compare and contrast riparian zones and riparian buffers based on their function. NRS.01.04.03.b. Assess techniques used in the creation, enhancement and management of riparian zones and riparian buffers. NRS.02.02.03.c. Evaluate how modern lifestyles affect resource consumption and energy use and devise a strategy to prevent the complete loss of a natural resource.	Landfill, Liquid Waste, Solid Waste, Recycle, Upcycle, Anthropogenic pollution, Pollution, Acid rain, Algae bloom, Benthic Macroinvertebrate (BMI), Bioindcator, Biomagnification, Biological Magnification, Dipolar molecule, Dissovled Oxygen (DO), Dredging, Effluent, Eutrophication, Filling, Gray Water, Hydroelectric power, Hydrogen bond, Hydroseeding, Ion, Mutation, Nonpoint source pollution, Persistent Bioaccumulation and toxic chemical (PBT), Point Source pollution, Radionuclide, Sewage, Solvent, Surface Tension, Universal Solvent, Wastewater, Water pollution, Active sampling, Air pollution, Airshed, Automatic Sampling, Cap-and-trade, Carbon Dioxide (CO2), Carbon footprint, Carbon Monoxide (CO), Carbon sequestration, Chemical Pollution, Emission offsetting, Emission trading, Ground-level ozone, Lead (Pb), Light pollution, Methane (CH4), Nitrogen Oxides (NOx), Noise pollution, Ozone (O3), Particulate Matter (PM), Passive sampling, Pollution credit, Primary pollutant, Secondary pollutant, Smog, Sulfur oxides (SOx), Tropospheric Ozone, Volatile organic compounds (VOCs), Zero Emission vehicle (ZEV), Zero Emissions, Riparian Buffers	Bioluminescence Lab, Water Quality, Water Remediation Lab, Stream Evaluation-macroinvertebrate studies, Titrations, Nutrient Cycling (N & P)	iPad, Computer, Pencil/Pen, Paper, Polluted Water Sample, Pipettes, Spoon, Extra Beaker, Filter, Funnel, Buffer, Sponge, Note Sheets, Water test kit, Pond Water Samples
Energy Resources & Consumption	April/May	Identify the natural resources that are mined in the United States; Explain the economic value of mining; Explain the different types of mining; Discuss the impact of mining on the environment; Identify types of natural resources; Explain why natural resources are important; Analyze which natural resources are limited and explain why they are limited; Compare and contrast conservation and preservation of natural resources; Compare and Contrast the benefits and drawbacks of renewable and nonrenewable energy	NRS.01.01. Apply methods of classification to examine natural resource availability and ecosystem function in a particular region. NRS.01.01.01.a. Summarize and classify the different kinds of natural resources using common classification schemes (e.g., living versus non-living, renewable versus nonrenewable, native versus introduced, etc.). NRS.02.04. Examine and explain how economics affects the use of natural resources. NRS.02.04.01.a. Compare and contrast how the economic value of a natural resource affects its availability. NRS.02.04.03.a. Compare and contrast the economic impact of green technology and alternative energy. NRS.03.01.04.a. Compare and contrast the costs and benefits (e.g., impacts on environment, economic, wildlife, etc.) of fossil fuels to a local, state and/or national economy. NRS.03.01.06.a. Compare and contrast the costs and benefits (e.g., environmental impacts, etc.) of alternative sources of energy (e.g., hydroelectric, solar, wind, biofuels, geothermal, etc.).	Acid rock drainage, Calcination, Cement, Coal, Commodity, Containment pond, Crude oil, Crushed stone, Fracking, Fracking slurry, Geologist, Hydrofracking, In-stiu mining, Limestone, Mining, Mountaintop Removal mining (MTR), Natural Gas, Offshore drilling, Open-pit mining, Overburden, Petroleum, Placer Mining, Quarry, Quartz, Reclamation, Seismic survey, Sinkhole, Strip mining, subsurface containment system, Subsurface mining, Surface mining, Tailings, Underground mining, Biofuel, Biomass, Biomass Energy, Environmental Stewardship, Exhaustible resource, Fossil Fuel, Inexhaustible resource, Natural Resource, Nonrenewable resource, Renewable Resource, Solar Energy, Solar Power, Uranium, Wind Energy, Hydropower, Geothermal Energy, Nuclear Energy	Renewable v. Nonrenewable Energy Class Debate, Biofuel Lab, Current Event	iPad, Debate Roles, Debate Scenario, Debate Planning Guide, Vegetable Oil, Sodium Hydroxide, Methanol, Mason Jars (Quart), Accurate Scale, Thermometer, Graduated Cylinder

Soil & Groundwater- What is it?, Erosion, Leaching, & Pollution, Controlling Erosion	May	Identify the functions of soil; Identify and define the components of soil; Explain how soil forms; Identify and explain soil horizons; Describe soil's physical characteristics; Explain the difference between percolation and infiltration; Explain the impact of soil chemistry regarding soil health and fertility; Explain how soils are classified; Describe how we evaluate soils and land for agricultural and other uses; Explain ways that soil degrades in the environment; Discuss how compaction degrades soil; Identify factors that contribute to soil erosion; Discuss how leaching degrades soil; Discuss how pollution degrades soil and ways in which it can be prevented; Explain how land classification is used to determine sustainable land use; Identify and explain how different tillage systems affect soil erosion; Identify erosion control structures and discuss their applications	NRS.01.01. Apply methods of classification to examine natural resource availability and ecosystem function in a particular region. NRS.01.01.01.b. Assess the characteristics of a natural resource to determine its classification. NRS.01.02.05.a. Research and examine the characteristics used to identify non-living resources (e.g., soil types, climate, geography, etc.). NRS.01.02.05.b. Apply identification techniques to determine the types of non-living resources in an area. NRS.01.05.04.a. Compare and contrast techniques associated with soil management (e.g., soil survey and interpretation, erosion control, etc.). NRS.01.05.04.b. Analyze a plot of land in order to determine which soil management techniques would be most applicable. NRS.01.05.04.c. Devise a soil management plan to minimize erosion and maximize biodiversity, plant productivity, and the formation of topsoil.	Acidic soil, Aeolian soil, Aeration, A-horizon, Alkaline soil, Alluvial soil, B-horizon, Cation Exchange Capacity (CEC), C-horizon (substratum), Colluvial soil, Cumulose soil, Fragipan, Glacial Till, Humus, Lacustrine soil, Land capability classification (LCC), Limiting layer, Loess soil, Marine Soil, Micronutrient, Mineral Soil, Minor/trace elements, Moraines, Neutral Soil, Nonmineral nutrients, O-horizon, Organic soil, Outwash plain, Parent Material, Ped, Percolation, pH, Primary macronutrient, R-horizon, Saturation, Secondary Macronutrient, Soil, Soil Classification, Soil Horizon, Soil Infiltration, Soil Profile, Soil Reactivity, Soil Structure, Soil Survey, Soil Texture, Topsoil, Weathering, Tillage, Reduced Till, No Till, Beach Erosion, Channel, Channel Erosion, Coastal Erosion, Erodibility Index (EI), Erodibility of soils, Eutrophication, Gully Erosion, Highly Erodible Land (HEL), Leaching, Overburden, Rill Erosion, Sediment, Sheet Erosion, Shoreline Erosion, Silt Fence, Slope, Soil compaction, Soil degradation, Soil Erosion, Splash Erosion, Streambank Erosion, T/T value, Water Erosion, Wind Erosion, Buffer Strip, Conservation buffer, Consrevation tillage, Contour Tillage, Conventional Tillage, Crop Residue, Cultivation, Fencerow, Field Tile, Gabion, Grassed Waterway, Great Plains Shelterbelt, Movement corridor, Mulch Tillage, Plant residue, Ridge tillage, Riparian buffer, Riparian zone, Riprap, Shelterbelt, Structural conservation practices, Subsurface drainage, Surface Drainage, Terrace, Tile Drainage, Water and sediment control basin (WASCOB), Windbreak, Zone tillage	Soil Horizons Activity, Soil Texture/Color Activity, Soil Water Holding Leaching Activity, Web Soil Survey Activity, Soil Testing Lab (pH, etc.), Soil Profile Lab, Watershed Lab	iPad or Computer, Soil Color Book, Soil pH Test kit, Soil Texture Flow Chart, Soil Samples, Soil Probes, Soil Fertilizer Problems, Edible Soil Profile Materials, Soil Note Sheets
Habitats, Conservation, Wildlife	May/June	Determine how fisheries are classified; Geographically locate the major marine fisheries; Discuss the history of fisheries and their management, including policies, laws, and administration; Explain the economic and environmental significance of fisheries; Identifty key species of vertebrate and invertebrate species that make up fisheries; Discuss the economic importance of hunting; Discuss methods of managing populations of major game animals; Identify and desscribe major game species of mammals and birds in North America; Describe harvesting methods of game animals; Explain zoonotic diseases and safety related to hunting; List and explain hunter ethics; Discuss issues related to hunting game animals	NRS.01.Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals. NRS.03.01.02.a. Research and describe methods by which wildlife can be sustainably harvested (e.g., controlled harvests, hunting licenses, regulations, etc.).	Anadromous, Aquaculture, Bycatch, Catadromous, Catch per unit effort (CPUE), Catch rate, Collapsed fishery, Commerical fishing, Conservation, Discards, Exclusive Economic Zone (EEZ), Fish farming, Fish management plan, Fisheries, Freshwater aquaculture, Freshwater fisheries, Fully exploited fishery, Ghost fishing, Hatchery, Mariculture, Marine aquaculture, Marine fisheries, Overexploited fishery, Overfished, Overfishing, Recovering fishery, Recreational (sport) fishing, Stock, Stock complex, Subsistence fishing, Sustainable fishery, Binomial nomenclature, Binomial/Scientific name, Boar, Buck, Bull, Chronic Wasting Disease (CWD), Cow, Doe, Estrus, Ewe, Extirpated, Fawn, Game species, Harvesting, Hen, Hunting Season, Jake, Mast, Muzzleloader, Piglet, Poaching, Poult, Ram, Rifle, Rifling, Rooster, Rut, Safety, Shot, Shotgun, Sow, Taxonomy, Tom (gobbler), Ungulate, Zoonotic Disease	Wildlife ID, Project Nest Watch - build nesting boxes, Deer Food Plot PBL, Day Old Pheasant Program	iPad, Food Plot Planning Sheet, Project Nest Watch Information, Wood, Shop Tools

Careers / Current Events	Scattered Throughout	Research career in or directly related to the environmental science/natural resources industries.	CS.05.01.01.a. Identify and summarize the steps to pursue a career in an AFNR pathway (e.g., self-assessment, set goals, etc.). CS.05.01.02.a. Examine the educational, training, and experiential requirements to pursue a career in an AFNR pathway (e.g., degrees, certifications, training, internships, etc.).	Conservation Scientist, Zoologist, Forest Firefighter, Ecologist, Geographer, Sustainability Project Manager, Conservation Advocate, Population biologist, Soil Scientist, Chief of Natural Resources Conservation Service USDA, Project Earthwork and Grading Supervisor, Soil Conservation Technician, Soil Conservationist, Hydrologist, Water Quality Technician, Thunder View Farms (Coombe Family), Wetlands Tour Guide, Meteorologist, Rangeland and Social Scientist, Wildlife Education Coordinator, Paleobiologist, Fish Biologist- U.S. Fish and Wildlife Service, Wildlife Biologist, Head of Procurement, Education and Volunteer Manager, Forestry Consultant, Project Director-Olmstead Parks Conservancy, Assistant Director- Parks and Recreation, Natural Areas Manager	Career Profile (s), Current Event Report	iPad, Computer, Pencil/Pen, Career Profile Sheet

Additional Topics should time permit: Surveying & Cartography and Weather/Climate/Geography

* Writing is involved in the assignment