Wallenpaupack Area School District
Planned Course Curriculum Guide

Department
CTE/Special Education Departments

Advanced Creative Outdoor Exploration

Course Description: This class combines the beauty of nature with the wonders of Science, Technology, Engineering, Art, and Math. Students will explore fundamental STEAM concepts through hands-on activities and outdoor adventures, making learning both fun and meaningful.

Initial Creation Date (if applicable) and Revision Dates: 4/30/25

Wallenpaupack Area School District Curriculum	
COURSE: Advanced Creative Outdoor Exploration	**GRADE/S:** 9-12+
UNIT*: Science in Nature	**TIMEFRAME:** ~ 8 classes

PA COMMON CORE/NATIONAL STANDARDS:

PA STEELS Standards

Environmental Literacy & Sustainability

- 3.4.9-12.D Apply research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope.
- 3.4.9-12.E Plan and conduct an investigation utilizing environmental data about a local environmental issue.

PA Technology and Engineering Standards

- *Nature and Characteristics of Technology and Engineering: 4.* Demonstrate how systems thinking involves considering relationships between every part, as well as how the systems interact with the environment in which it is used.
- *Integration of Knowledge, Technologies, and Practices: 2.* Analyze how different technological systems often interact with economic, environmental, and social systems.
- *Applying, Maintaining, Assessing and Evaluating Technological Products and Systems: 2.* Analyze how the creation and use of technologies consumes renewable, non-renewable, and inexhaustible resources; creates waste; and may contribute to environmental challenges.

UNIT OBJECTIVES (SWBATS):

Upon unit completion, students will be able to identify and discuss applications of science in nature and outdoor exploration.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Nature Scavenger Hunt: Create a list of items for students to find in nature, such as different types of leaves, rocks, insects, or flowers, to observe and learn about biodiversity.
- Weather Observation: Discuss and record daily weather conditions and learn about meteorology; Collect weather data using observation and simple tools (ex: thermometer, rain gauge, weathervane, etc.).
- Bug Safari: Equip students with magnifying glasses and guide them on a bug hunt to observe insects in their natural habitat and learn about their roles in the ecosystem.
- Bird Watching: Provide binoculars and a bird guidebook so students can observe different bird species, learn about their behaviors, and record their findings; Use app to identify birds based on their song.
- Partner with environmental class on Trout in the Classroom activities
- Sample various outdoor recreation activities, such as ropes course, hiking, fishing, gardening, etc.
- Trips to local outdoor sites (ex: Promised Land State Park, Lacawac Sanctuary, Lake Trip sites, etc.)
- View various animal cams and discuss animal behavior (ex: eagle, osprey, bear, wolf, etc.)

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Completion of classroom projects
- Participation in class activities

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Small group
- Paraprofessional support
- Modification of assignments:
    - Accept various response types (ex: written vs. verbal (FlipGrid))
    - Provide appropriate accommodations based on the student's IEP

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Trout in the Classroom: https://www.patroutintheclassroom.org/
- Weather site(s)
- Merlin Bird ID by Cornell Lab iPad App
- Wonderopolis
- DiscoveryEd

KEY VOCABULARY:

- Ecosystem: A community of living organisms and their environment.
- Habitat: The natural home or environment of an animal, plant, or other organism.
- Biodiversity: The variety of life in a particular habitat or ecosystem.
- Adaptation: A change or the process of change by which an organism becomes better suited to its environment.
- Food Chain: A series of organisms each dependent on the next as a source of food.
- Predator: An animal that hunts and eats other animals.
- Prey: An animal that is hunted and eaten by predators.
- Climate: The weather conditions in an area over a long period.
- Weather: The state of the atmosphere at a particular place and time, including temperature, humidity, and precipitation.
- Precipitation: Any form of water that falls from the sky, such as rain, snow, sleet, or hail.
- Soil: The top layer of the earth where plants grow, made up of organic matter, minerals, and water.
- Nutrient: A substance that provides nourishment essential for growth and the maintenance of life.
- Organism: Any living thing, including plants, animals, and microorganisms.
- Conservation: The protection and preservation of natural resources.

Wallenpaupack Area School District Curriculum	
COURSE: Advanced Creative Outdoor Exploration	**GRADE/S:** 9-12+
UNIT*: Technology in Nature	**TIMEFRAME:** ~ 8 classes

PA COMMON CORE/NATIONAL STANDARDS:

PA STEELS Standards

Environmental Literacy & Sustainability

- 3.4.9-12.D Apply research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope.
- 3.4.9-12.E Plan and conduct an investigation utilizing environmental data about a local environmental issue.

Technology & Engineering

- 3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.
- 3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.
- 3.5.9-12.P Apply a broad range of design skills to a design thinking process.
- 3.5.9-12.Q Implement and critique principles, elements, and factors of design.
- 3.5.9-12.U Evaluate and define the purpose of a design.
- 3.5.9-12.AA Safely apply an appropriate range of making skills to a design thinking process.
- 3.5.9-12.DD Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.

PA Technology and Engineering Standards

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- *Integration of Knowledge, Technologies, and Practices: 2.* Analyze how different technological systems often interact with economic, environmental, and social systems.
- *Applying, Maintaining, Assessing and Evaluating Technological Products and Systems: 2.* Analyze how the creation and use of technologies consumes renewable, non-renewable, and inexhaustible resources; creates waste; and may contribute to environmental challenges.

UNIT OBJECTIVES (SWBATS):

Upon unit completion, students will be able to identify and discuss applications of technology in nature and outdoor exploration.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Drone Exploration: Use a drone to capture aerial footage of the school grounds or a nearby park to learn about drone technology and get a bird's-eye view of their environment
- Virtual Field Trips Use online resources to take virtual field trips to national parks, forests, and other natural sites to provide an immersive learning experience about different ecosystems; Learn about and map one natural park a week
- Apps for Animal Identification: Use app to identify birds based on their song
- Geocaching Adventure Lab App: Play and share unique outdoor scavenger hunts, experiences, and games that involve finding clues, solving puzzles, and completing adventures one location at a time

- Nature Photography: Use tablets to take photos of plants, animals, and landscapes; Create digital album or a slideshow presentation of findings

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Completion of classroom projects
- Participation in class activities

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Small group
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      Provide appropriate accommodations based on the student's IEP

RESOURCES (Technology Based Resources, Text Resources, etc.):

Merlin Bird ID by Cornell Lab iPad App
Wonderopolis
DiscoveryEd
National Geographic
National Park web resources
Geocache Adventure Lab App https://labs.geocaching.com/
Camera (iPad)

KEY VOCABULARY:

- GPS (Global Positioning System): A system that uses satellites to determine the precise location of something on Earth.
- Drone: An unmanned aerial vehicle (UAV) used for capturing images or videos from the sky.
- Alternative Energy: Energy from the sun/wind/water that is converted into thermal or electrical energy.
- App (Application): A software program designed to perform a specific task, such as identifying plants or animals.
- Weather Station: A set of instruments and equipment used to measure and record weather conditions.
- Geocaching: An outdoor recreational activity where participants use GPS to hide and seek containers, called "geocaches."
- Renewable Energy: Energy from sources that are naturally replenishing, such as solar, wind, and water.
- Biodegradable: A substance that can be broken down naturally by microorganisms and other living things.
- Satellite: An artificial object placed in orbit around the Earth or another planet to collect information or for communication.
- Hydropower: Power generated from the energy of moving water.
- Wind Turbine: A device that converts the wind's kinetic energy into electrical energy.
- Ecosystem Monitoring: The use of technology to observe and track changes in an ecosystem over time.

Wallenpaupack Area School District Curriculum	
COURSE: Advanced Creative Outdoor Exploration	**GRADE/S:** 9-12+
UNIT*: Engineering in Nature	**TIMEFRAME:** ~ 8 classes

PA COMMON CORE/NATIONAL STANDARDS:

PA STEELS Standards

Environmental Literacy & Sustainability

- 3.4.9-12.D Apply research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope.
- 3.4.9-12.E Plan and conduct an investigation utilizing environmental data about a local environmental issue.

Technology & Engineering

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- 3.5.9-12.DD Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.

PA Technology and Engineering Standards

- *Nature and Characteristics of Technology and Engineering: 4.* Demonstrate how systems thinking involves considering relationships between every part, as well as how the systems interact with the environment in which it is used.
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UNIT OBJECTIVES (SWBATS):

Upon unit completion, students will be able to identify and discuss applications of engineering in nature and outdoor exploration.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Build a Birdhouse: Students can design and construct birdhouses using simple materials.
- Water Filtration Experiment: Create a mini water filtration system using sand, gravel, and activated charcoal.
- Wind Turbine Models: Using paper, cardboard, and small motors, students can build wind turbine models.
- Plant Growth Observation: Set up a controlled experiment to observe how different variables (light, water, soil type) affect plant growth.
- Nature Scavenger Hunt: Organize a scavenger hunt where students find examples of natural engineering, like spider webs, bird nests, or beaver dams.

- Bridge Building Challenge: Using natural materials like sticks, stones, and leaves, students can work in teams to build small bridges over a stream or gap.
- Solar Oven Construction: Build a solar oven using a cardboard box, aluminum foil, and plastic wrap.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Completion of classroom projects
- Participation in class activities

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Small group
- Paraprofessional support
- Modification of assignments:
  - Accept various response types (ex: written vs. verbal (FlipGrid))
  - Provide appropriate accommodations based on the student's IEP

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Wonderopolis
- DiscoveryEd
- National Geographic
- Crash Course Engineering for Kids
- TeachEngineering.org

KEY VOCABULARY:

- Structure: A building or object constructed from several parts.
- Bridge: A structure built to span physical obstacles like water or roads.
- Design: The plan or drawing produced to show the look and function of a building or object.
- Materials: The substances used to build structures, such as wood, metal, or stone.
- Construction: The process of building something.
- Stability: The ability of a structure to remain unchanged or balanced.
- Foundation: The lowest part of a building, typically below ground level, that supports the structure.
- Load: The weight or force that a structure must support.
- Force: A push or pull that can change the motion of an object.
- Gravity: The force that attracts objects toward the center of the Earth.
- Balance: The ability to maintain stability and not tip over.
- Wind Energy: Energy generated from the wind, often used to power wind turbines.
- Solar Power: Energy harnessed from the sun, used in solar panels.
- Renewable Resource: A natural resource that can be replenished naturally over time.
- Hydropower: Power generated from the energy of moving water.
- Wind Turbine: A device that converts the wind's kinetic energy into electrical energy.
- Simple Machine: A basic mechanical device that helps make work easier, such as a lever or pulley.
- Prototype: A first or preliminary model of something from which other forms are developed.
- Engineer: A person who designs, builds, or maintains engines, machines, or structures.

Wallenpaupack Area School District Curriculum	
COURSE: Advanced Creative Outdoor Exploration	**GRADE/S:** 9-12+
UNIT*: Art in Nature	**TIMEFRAME:** ~ 8 classes

PA COMMON CORE/NATIONAL STANDARDS:

PA STEELS Standards

Environmental Literacy & Sustainability

- 3.4.9-12.D Apply research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope.
- 3.4.9-12.E Plan and conduct an investigation utilizing environmental data about a local environmental issue.

Technology & Engineering

- 3.5.9-12.P Apply a broad range of design skills to a design thinking process.
- 3.5.9-12.Q Implement and critique principles, elements, and factors of design.
- 3.5.9-12.U Evaluate and define the purpose of a design.

PA Technology and Engineering Standards

- *Integration of Knowledge, Technologies, and Practices: 2.* Analyze how different technological systems often interact with economic, environmental, and social systems.

PA Arts & Humanities Standards

- 9.1.12.B Recognize, know, use and demonstrate a variety of appropriate arts elements and principles to produce, review and revise original works in the arts.

UNIT OBJECTIVES (SWBATS):

Upon unit completion, students will be able to identify and discuss applications of art in nature and outdoor exploration.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Create artistic models of plants and animals observed in nature (ex: egg carton mushrooms, toilet paper roll birds, etc.)
- Investigate light and shadows through the creation of shadow suncatchers.
- Use iPad to take nature photography; Assemble into a digital portfolio/slideshow.
- Create art from objects found in nature (ex: botanical suncatchers, pinecone owls, leaf butterflies, etc.)
- Create mandala(s) on the ground using found objects (ex: leaves, stones, etc.) photograph and observe /record changes over time.
- Use SketchBook iPad app to sketch scenes/objects from nature.
- Explore textures in nature by taking rubbings of natural objects (trees, leaves, rocks, etc.)
- Collect and press leaves, flowers, etc. and compare and contrast those collected

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Completion of classroom projects
- Participation in class activities

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Small group
- Paraprofessional support
- Modification of assignments:
    - Accept various response types (ex: written vs. verbal (FlipGrid))

- Provide appropriate accommodations based on the student's IEP

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Sketch Book iPad app
- Camera (iPad)

KEY VOCABULARY:

- Collage: A piece of art made by sticking various materials such as paper, fabric, or natural items onto a surface.
- Texture: The feel, appearance, or consistency of a surface or material.
- Pattern: A repeated decorative design.
- Color: The property of an object that produces different sensations on the eye as a result of the way it reflects or emits light.
- Shape: The external form or appearance of an object defined by its outline.
- Design: A plan or drawing produced to show the look and function of an object or artwork.
- Natural Materials: Items found in nature, such as leaves, rocks, flowers, and twigs, used in art projects.
- Sculpture: A three-dimensional work of art made by shaping or combining materials.
- Landscape: A picture representing natural scenery.

Wallenpaupack Area School District Curriculum	
COURSE: Advanced Creative Outdoor Exploration	**GRADE/S:** 9-12+
UNIT*: Math in Nature	**TIMEFRAME:** ~ 8 classes

PA COMMON CORE/NATIONAL STANDARDS:

PA Core Mathematics Standards

Number and Quantity

- CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Geometry

- CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects
- CC.2.3.HS.A.14 Apply geometric concepts to model and solve real world problems.

Statistics and Probability

- CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
- CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.
- CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

PA STEELS Standards

Environmental Literacy & Sustainability

- 3.4.9-12.D Apply research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope.
- 3.4.9-12.E Plan and conduct an investigation utilizing environmental data about a local environmental issue.

UNIT OBJECTIVES (SWBATS):

Upon unit completion, students will be able to identify and discuss applications of math in nature and outdoor exploration.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Leaf Symmetry: Collect leaves and examine their symmetry.
- Tree Height Estimation: Teach students how to estimate the height of a tree using simple tools like a ruler and a protractor.
- Graphing Weather Data: Record daily weather data (temperature, rainfall, etc.) and create graphs to visualize the information.
- Seed Counting and Sorting: Provide several types of seeds and have students count and sort them by size, shape, or color.
- Nature Walk Math: During a nature walk, have students count different types of plants, animals, or rocks they see.
- Measuring Shadows: On a sunny day, students can measure the length of their shadows at various times and record the data.

- Rock Patterns: Collect rocks and create patterns based on size, color, or shape.
- Math Scavenger Hunt: Organize a scavenger hunt where students find items that represent different math concepts, such as shapes, numbers, or patterns.
- Navigation: Utilize local parks and school grounds to practice orienteering and navigation skills. Practice navigational skills like trail markers.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Completion of classroom projects
- Participation in class activities

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Small group
- Paraprofessional support
- Modification of assignments:
    - Accept various response types (ex: written vs. verbal (FlipGrid))
    - Provide appropriate accommodations based on the student's IEP

RESOURCES (Technology Based Resources, Text Resources, etc.):

Measurement tools
Maps of local parks/areas
Compass
GPS enabled device (iPad)
Mapping sites (ex: Google Maps)

KEY VOCABULARY:

- Symmetry: When two parts of a whole are identical or similar in shape and size.
- Pattern: A repeated decorative design or sequence.
- Measurement: The size, length, or amount of something, typically measured in units.
- Geometry: The branch of mathematics involving points, lines, shapes, and space.
- Angle: The space between two intersecting lines or surfaces at or close to the point where they meet.
- Perimeter: The continuous line forming the boundary of a closed geometric figure.
- Area: The extent of a two-dimensional surface within a boundary.
- Volume: The amount of space that a substance or object occupies.
- Estimation: A rough calculation or educated guess of the value, number, quantity, or extent of something.
- Data: Facts and statistics collected together for reference or analysis.
- Graph: A diagram representing data, typically showing the relationship between two or more variables.
- Chart: A visual representation of data, often in the form of a table, graph, or diagram.
- Scale: A system of ordered marks at fixed intervals used as a reference standard in measurement.
- Navigation: Finding your way in physical space using tools such as a compass, GPS, and/or natural features
- Direction: a way of classifying path of travel or movement.

* Unit sequence and timing will be flexible and dependent on weather, facility availability, and other factors. Units may overlap and transition back and forth as determined by the aforementioned factors and teacher discretion.