

Science

Stonington Public Schools



Surviving the Outdoors

Stonington Public Schools

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Science Vision Statement

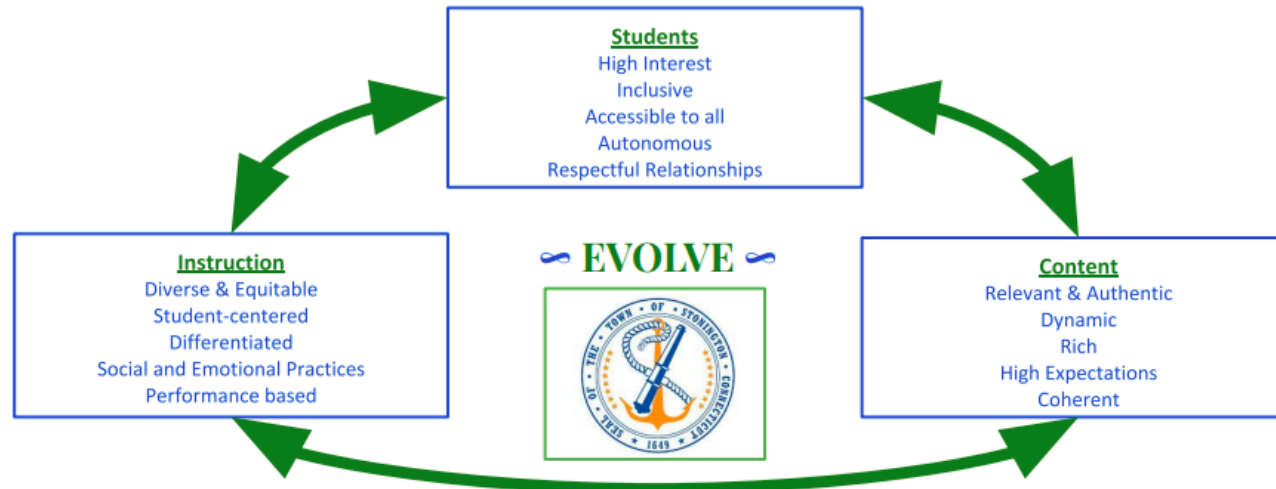
The Stonington K-12 Science curriculum provides a comprehensive, problem-based education focused on the Next Generation Science Standards. The curriculum fosters

- High-quality authentic science education for every student
- Fluency in the Science and Engineering practices
- A recognition of the full implications of the scientific world
- The utilization of scientific concepts and phenomena to consider, connect, communicate and convince
- Rigorous and relevant learning environments

Students will become scientifically literate citizens able to contribute to a rapidly advancing, STEM-driven world, taking action in local, national and global issues.



District Curriculum Philosophy



Curriculum Philosophy from a Student Perspective

Students in Stonington Public Schools will experience and engage with an inclusive curriculum. The curriculum will encompass a variety of experiences and will be accessible to all students while providing a strong foundation for students to have a voice and make a positive impact in the modern world. The curriculum will be a living entity, ever evolving to meet the students' needs in a changing society.

Curriculum Philosophy from an Instructional Perspective

Instruction in Stonington Public Schools will be responsive and students will feel represented through culturally, socially, and emotionally conscious practices. It will be meaningful to students by incorporating multifaceted pedagogical approaches including inquiry, collaboration, and reflection. Instruction will provide all students opportunities to respond, equitable assessments, and positive feedback. Teachers will engage in dynamic and reflective practices to advance their craft.

Curriculum Philosophy from a Content Perspective

Content in Stonington Public Schools will be constantly adapting to reflect current and relevant information along with the state and national standards for each discipline. Through a rich, authentic, and coherent curriculum, students will learn that the past informs the future. The curriculum will be complex and will provide optimum challenges for all students with the goal of preparing knowledgeable, problem solving, productive citizens who are career and college ready and prepared for the diverse global community.

We Believe In You



1. **Convince:** Use critical thinking skills and a variety of relevant evidence to solve a problem, support a position, or present an idea.
2. **Communicate:** Use content area language clearly to convey ideas as an individual. Communicate with others in a way that facilitates a collaborative process.
3. **Consider:** Use all learning to develop innovative and/or creative options to solve challenging situations and/or problems.
4. **Connect:** Use technology to find, evaluate, create and/or share information, ethically and legally. Connect all learning to become a participative member in the social and civic community.

Surviving the Outdoors

Critical Areas of Focus (Course Description)

This one semester, hands-on elective course will educate students on a variety of unique skills involved in wilderness survival. Students will have the opportunity to practice and apply these unique skills in an actual outdoor environment. Students will experience similar skills often portrayed in survival documentaries. The one semester long course would teach students the following: Map Reading/Land Navigation, Basic First Aid, Emergency Communication Techniques, Food and Water Procurement, Fire Starting Techniques, Finding & Building Shelters.

Length ½ year, Credit ½

Pacing Guide (Semester Course)

Quarter One	Quarter Two	
Unit 1	Unit 2	Unit 3
Introduction Navigation & Communication	Wilderness First Aid	Basic Survival Needs (shelter, food, water)
~18 classes @ 75 minutes	~ 10 classes @ 75 minutes	~15 classes @ 75 minutes

Unit One

<u>Name of Unit:</u> Introduction Navigation & Communication	<u>Length of unit: (number of classes/minutes per meeting)</u> ~20 classes @ 75 minutes
Content Standards Addressed in the Unit:	
<u>Next Generation Science Standards</u> HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. (<i>communication</i>) HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. (<i>navigation</i>) <u>Connecticut Elementary and Secondary Social Studies Standards</u> GEO 9–12.1 Use geospatial and related technologies to create maps to display and explain the spatial patterns of cultural and environmental characteristics. GEO 9–12.2 Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their political, cultural, and economic dynamics. GEO 9–12.3 Use geographic data to analyze variations in the spatial patterns of cultural and environmental characteristics at multiple scales. <u>CCSS Geometry Standards</u> CCSS.MATH.CONTENT.HSG.MG.A.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk). CCSS.MATH.CONTENT.HSG.MG.A.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile). CCSS.MATH.CONTENT.HSG.MG.A.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). CCSS.MATH.CONTENT.HSG.GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g.,	

using the distance formula.

CCSS.MATH.CONTENT.HSG.CO.D.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).

ISTE Standards

1.3. Knowledge Constructor

- 1.3.d. build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

1.5. Computational Thinker

- 1.5.b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- 1.5.c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

<u>Big Ideas:</u> ● The concepts of relative and absolute location, latitude, longitude and cardinal directions, as well as the principles of maps and a compass are used for navigational communication.	<u>Essential Question(s):</u> ● How can I use different methods of navigation to communicate, locate, and orient?
<u>Students will know:</u> ● The importance of being planned and prepared when going into the wilderness ● What is needed to be prepared in different wilderness scenarios ● How to find directions without a map or compass ● How to measure in latitude and longitude ● The meanings of symbols and topography on a map	<u>Students will be able to:</u> ● Describe the necessities to be prepared for going into the wilderness ● Explain the concepts of coordinates and cardinal directions. ● Determine direction without a compass ● Explain the importance of using a common set of symbols and methods when making maps.

• How to read and measure using a map scale • The parts of a compass and how to read the bearings • How to convert azimuths • How to find a location using a map, compass or both	• Identify topographic symbols and terrain features on a Map • Describe how using and understanding maps and compasses can help determine one's location. • Describe latitudinal and longitudinal numbers and how to measure distance using those numbers. • Determine the elevation of a point on the ground using a map • Determine the grid coordinates of a point on a map • Measure distance on a map • Convert azimuths • Explain bearing measurements. • Understand the major features of maps and compasses • Understand how scaling works • Describe how to use a map and compass to do triangulation and determine locations.
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Significant tasks:

Significant task 1: [Introduction](#)

Students can begin by participating in a [survival simulation game](#). The scenario can consist of a situation such as a plane crash in January and several items that the group has to prioritize in order of importance to survive. Groups can share their list, explaining why they prioritized certain items. Next, the importance of planning and preparations when going outdoors can be discussed. Students can list what they think should be considered (clothing, terrain, first-aid kit, communication, itinerary) and each can be talked about. Natural reactions and a look at stress during survival situations can be researched. Finally, students can read various survival stories, such as [Aron Ralson](#), [Beck Weathers](#), [Juliane Koepcke](#) (include diversity). Students can then analyze the events to determine what was done correctly and what was in error. They can share what they would do differently. Students could be given or choose/create a scenario such as hiking in the mountains, kayaking in the ocean, or camping in the desert and they could list steps of what needs to be planned and prepared to have a successful experience.

Timeline: 6 days @ 75 minutes

Significant task 2: Reading a Map

Students can begin by answering a question such as ‘How do you know where you live’?. After hearing, we just know, ask them how they would tell someone how to get to their house. Their methods should be listed (maps, compass, GPS, landmarks). Students can make grids of the classroom or outdoor area to locate objects or play Battleship as an introduction/review of latitude and longitude. They can also learn the importance of magnetic directions for maps and could make a basic compass to determine the direction north in the classroom. Students can be provided with various topographic maps. They can then share what they think the map describes. They should notice that maps often look different, but most maps have similarities such as scale, grid, legends, colors, orientations (magnetic north), and topography (contour levels). Students should then look at similar topological maps to interpret the features. Students could look at various landforms/elevations and determine how they would be represented on a topological map. As a performance assessment, students could create a map of an outside area. The map should show an understanding of the scale and relative locations of the features depicted.

Timeline: 8 classes @ 75 minutes

Significant task 3: Navigating with a compass

After a discussion of the history of orienteering, students should learn the parts of a compass (magnetic needle, housing, base plate). Students should participate in an activity to learn the fundamental skills of a compass, such as determining the correct magnetic azimuth degree and determining the elevation of a designated point. Next, they can navigate from one point on the ground to another point, making sure to determine their pace count. Next, they can learn basic triangulation and then triangulation on a map. Finally, students should learn how to correct for magnetic declination. Students are now ready to convert the magnetic azimuth to a grid azimuth and can use a compass with a topographical map to determine and navigate to an unknown point. As a suggested performance assessment, assign student pairs two identifiable locations on a topo map. Students should find the landmarks outside and take their bearings, making sure to correct for declination.

Timeline: 4 classes @ 75 minutes

Common Learning Experiences:

- Opportunities to Respond
- Field work
- Performance based scenarios
- Cooperative Grouping
- Scientific Discourse
- [Science and Engineering practices](#)
- [Mathematical Practices](#)
- Computer simulations
- Developing a Driving Question Board
- Form claims based on evidence and reasoning
- Exit Tickets
- Concept Quizzes

Key vocabulary:

Cardinal directions, compass, equator, latitude, longitude, altitude, course, estimated position, landfall, geometry, topography, trigonometry, accuracy, precision, bearing, compass, azimuth, contour lines, elevation, legend, orientation, scale, topographical map, triangulation

Evidence of Understanding - Common Assessments

- Survival Story Summaries (compare and contrast the successes & mistakes)
- Map Reading Exercises
 - Latitude & Longitude
 - Determining Topography
 - Measuring with Scale
- Map Creation of a chosen location (rubric)
- Compass Diagram
- Azimuth Conversions

- Performance Based Assessment: Following coordinates to find an object/location

Teacher notes:

- Resources:
 - [*Soldier's Manual of Common Tasks, Warrior Skills Level 1*](#). Headquarters Department of the Army. June, 2009
 - <https://thesurvivaluniversity.com/survival-tips/wilderness-survival-tips/navigation/>
- Anticipated Student Misconceptions:
 - Maps and compasses are not needed in the wilderness because cellphones can be used for navigation and to call in case of emergencies.
- Differentiation Strategies:
 - NGSS Appendix D - "All Standards, All Students":
[Making the Next Generation Science Standards Accessible to All Students](#)
 - [Tier 1 Universal Strategies](#)
 - [Tier 2 Targeted Strategies](#)
 - [Tier 3 Intensive Strategies](#)
- Safety Considerations:
 - Teachers should be aware of students' outdoor medical concerns (insects, plants).
 - Teachers should carry a walkie talkie to connect to the office when outside.
 - Students should be aware of and follow outdoor safety expectations.
- Prior Knowledge:
 - Dependent on students' experiences.
- Interdisciplinary Connections:
 - Social & Emotional Standards: CASEL Core Competencies

- Self-awareness: Know your strengths and limitations, with a well-grounded sense of confidence, optimism, and a growth mindset.
- Self-management: Effectively manage stress, control impulses, and motivate yourself to set and achieve goals.
- Social awareness: Understand the perspectives of others and empathize with them, including those from diverse backgrounds and cultures.
- Relationship skills: Communicate clearly, listen well, cooperate with others, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help when needed.
- Responsible decision-making: Make constructive choices about personal behavior and social interactions based on ethical standards, safety, and social norms”
- English Language Arts Standards » Science & Technical Subjects » Grade 11-12
 - CCSS.ELA-LITERACY.RST.11-12.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
 - CCSS.ELA-LITERACY.RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
 - CCSS.ELA-LITERACY.RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Unit Two

<u>Name of Unit:</u> Wilderness First Aid	<u>Length of unit: (number of classes/minutes per meeting)</u> ~8 classes @ 75 minutes
Content Standards Addressed in the Unit:	
<u>Healthy and Balanced Living Curriculum Framework</u> <i>Core Content Standard 1: Safety and Injury Prevention (SIP)</i> SIP 1.1.12 Demonstrate how to provide basic First Aid in a variety of emergency situations. SIP 1.4.12 Unintentional Injury. SIP 1.7.12 Prioritize actions to take to prevent injuries during severe weather. SIP 1.9.12 Summarize ways to reduce safety hazards in the community. SIP 1.10.12 Describe actions to take in case of mass trauma. SIP 1.11.12 Explain accepted procedures for basic emergency care and lifesaving. <u>Next Generation Science Standards</u> Science & Engineering Practices 1. Asking Questions and Defining Problems 2. Developing and Using Models 4. Analyzing and Interpreting Data 5. Using Mathematics and Computational Thinking 6. Constructing Explanations and Designing Solutions 8. Obtaining, Evaluating, and Communicating Information	

<u>Big Ideas:</u> • Wilderness first aid is the assessment and treatment given to an ill or injured person in a remote environment.	<u>Essential Question(s):</u> • How are injured/ill patients treated when health care professionals and/or rapid transport are not readily available?
<u>Students will know:</u> • The steps to assessing a medical situation including a patient assessment and history • How to take and analyze a patient's vital signs • The symptoms and wilderness treatment for: ○ Shock ○ Chest, head, & spine injuries ○ Bone & Joint Injuries ○ Bleeding ○ Abrasions, lacerations & blisters ○ Chafing, burns & bites • The causes and signs of several weather/environmental issues	<u>Students will be able to:</u> • Define wilderness first aid • Describe the importance of immediately establishing control of the scene • Demonstrate how to perform an initial assessment including a quick scan for major bleeding and assessing airway, breathing, circulation, disability, and the environment (ABCDEF method) • Discuss the importance of vital signs and how they can change over time • Demonstrate how to take a set of vital signs including level of response (LOR); heart rate, regularity and quality (HR); respiratory rate, rhythm, and quality (RR); and skin color, temperature, and moisture • Demonstrate taking a patient history by asking questions related to symptoms, allergies, medications, pertinent medical history, last intake and output, and events surrounding the incident (SAMPLE) • Demonstrate a field assessment and wilderness treatment of a patient with a chest, head, or spine injury • Define shock and discuss briefly the signs, symptoms, and emergency treatment of a patient with shock • Define the sign, symptoms, and wilderness treatment of a strain, sprain, fracture, and dislocation

	● Define RICE (rest, immobilize, cold, and elevate) and describe its use ● Define serious bleeding and demonstrate control of bleeding including direct pressure, packing the wound, and tourniquets ● Define abrasion, laceration, and blister, and demonstrate the wilderness treatment for each ● Define and describe the wilderness treatment for chafing, burns, and bites ● Describe the emergency treatment for specific weather/environmental situations such as heat problems, allergies, lightning, altitude sickness, submersion, and abdominal issues
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Significant tasks:

Significant task 1: Patient Assessment

Students can begin by determining how wilderness first aid differs from general first aid. They can hypothesize and research what should be in a wilderness first aid kit considering the size of the group, destination, duration and time of the year. Students can learn the importance of an initial (primary) patient assessment using the ABCDE model (airway, breathing, circulation, disability, environmental threats). Next, they can demonstrate a focused (secondary) assessment which includes a physical exam (wounds, swelling, or other deformities) and vital signs (level of responsiveness, heart rate, respiratory rate, skin color, temperature, & moisture). Following that, students can get the patient's history using SAMPLE (symptoms, allergies, medications, past medical history, last intake/output, events). All information should be documented as soon as it doesn't interfere with patient care using SOAP (subjective information, objective information, assess the patient, plan your treatment. Students can perform practice assessments with mock patients in different scenarios.

Timeline: ~2 classes @ 75 minutes

Significant task 2: Injuries

First, students should think about the guidelines for evacuation determining what injuries would require a slow evacuation or a rapid evacuation. Using a guide, such as The Wilderness First Aid Curriculum and Doctrine Guidelines, students should discover the guidelines for recognizing and treating severe issues such as chest injuries, shock, heart attacks, and head & spine injuries. Discussion should occur about how to prevent these injuries in the first place. For bone and joint injuries, students should define and demonstrate RICE (rest, immobilize, cold, and elevate). Students should research ways to immobilize several bones/joints and then demonstrate their splint improvisations. Next, students can discover how to treat various wounds. They should define and demonstrate how to control bleeding such as direct pressure, packing the wound, and tourniquets. After defining abrasions, lacerations, and blisters, students should demonstrate how to best treat and clean the wounds in the wilderness. Burns, bites, and chafing should also be discussed.

Timeline: ~4 classes @ 75 minutes

Significant task 3: Weather/Environmental related issues

Given specific situations, students can predict what injuries could occur. A list could be made of these injuries such as hypothermia, submersion, heat problems, lightning, altitude illness, abdominal problems, allergies. The teacher can determine how to present these issues (direct instruction, student research & presentation). Working in groups, students could research the issue and its first aid treatment and then share it to the class in a method of choice (jigsaw, gallery walk, presentation)

Timeline: ~2 classes @ 75 minutes

Common Learning Experiences:

- Opportunities to Respond
- Field work
- Performance based scenarios
- Cooperative Grouping
- Scientific Discourse
- Science and Engineering practices
- Developing a Driving Question Board
- Form claims based on evidence and reasoning

- Exit Tickets
- Concept Quizzes

Key vocabulary:

Wilderness first aid, mechanism of injury (MOI), ABCDEF method, SAMPLE history, RICE, fracture, dislocation, strain, sprain, dislocation, splint, abrasion, laceration, blister, tourniquet

Evidence of Understanding - Common Assessments

- Demonstrations and Descriptions of Wilderness Improvisational Treatment
 - Patient Assessment and History
 - Bone/Joint Injury
 - Shock
 - Heat, Chest, or Spine Injury
 - Bleeding
 - Burns, Bites, Blisters, or Chafing
- Weather/Environmental Issue Presentation

Teacher notes:

- Resources:
 - [*Soldier's Manual of Common Tasks, Warrior Skills Level 1*](#). Headquarters Department of the Army. June, 2009
 - [*Wilderness First Aid Curriculum and Doctrine Guidelines*](#), Boy Scouts of America, 2017
 - <https://thesurvivaluniversity.com/survival-tips/wilderness-survival-tips/wilderness-medicine/>
- Anticipated Student Misconceptions:
 - First Aid in the wilderness is the same as at home/school.
- Differentiation Strategies:

- NGSS Appendix D - "All Standards, All Students":
[Making the Next Generation Science Standards Accessible to All Students](#)
- [Tier 1 Universal Strategies](#)
- [Tier 2 Targeted Strategies](#)
- [Tier 3 Intensive Strategies](#)
- Safety Considerations:
 - Teachers should be aware of students' outdoor medical concerns (insects, plants)
 - Teachers should carry a walkie talkie to connect to the office when outside.
 - Students should be aware of and follow outdoor safety expectations.
 - Students should only demonstrate how to set up a tourniquet, not actually complete the procedure.
- Prior Knowledge:
 - Basic first aid is taught/discussed in Advanced Health.
 - Some students may have first aid certification through scouting, babysitting courses, and lifeguard certification.
- Interdisciplinary Connections:
 - Safety & Injury Prevention: Healthy and Balanced Living Health Curriculum
 - Anatomy & Physiology connections
 - Social & Emotional Standards: CASEL Core Competencies
 - Self-awareness: Know your strengths and limitations, with a well-grounded sense of confidence, optimism, and a growth mindset.
 - Self-management: Effectively manage stress, control impulses, and motivate yourself to set and achieve goals.
 - Social awareness: Understand the perspectives of others and empathize with them, including those from diverse backgrounds and cultures.
 - Relationship skills: Communicate clearly, listen well, cooperate with others, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help when needed.
 - Responsible decision-making: Make constructive choices about personal behavior and social interactions based on ethical standards, safety, and social norms"

Unit Three

<u>Name of Unit:</u> Basic Human Needs (water, shelter, food, fire)	<u>Length of unit: (number of classes/minutes per meeting)</u> ~15 classes @ 75 minutes
Content Standards Addressed in the Unit:	
<u>Next Generation Science Standards</u> HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. <i>(potable water)</i> HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. <i>(food procurement)</i> HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. <i>(fire-building, shelter)</i> HS-PS3-1 Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. <i>(fire-building, cooking)</i> HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. <i>(fire-building, shelter, cooking)</i> HS-PS3-4. Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system <i>(second law of thermodynamics).</i> HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. <i>(food procurement)</i> HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. <i>(shelter-building)</i> HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity <i>(fire-building, food, shelter)</i> HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. <i>(food, water, shelter, first aid)</i> HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. <i>(food, water, shelter, first aid)</i>	

<u>Big Ideas:</u> Knowing how to make shelter and find water and food in outdoor situations is vital for survival.	<u>Essential Question(s):</u> - What are various ways to make fire and shelter in the outdoors and why are both so important? - How can I find water and food outdoors?
<u>Students will know:</u> - Shelter protects the body from excess exposure from the sun, cold, wind, rain, or snow - Clothing is the first line of shelter protection - The importance of layers and appropriate materials for the environment - How to build several shelters such as a lean-to - Food and water are vital to human survival - How to find water (solar still, transpiration bag) - Ways to filter water - Ways to purify water (boiling, bleach, iodine) - Common waterborne parasites and/or bacteria - Several common wild edible plants - NOT to eat any plants that are not known - A few techniques to capture animals (snares, traps, fishing pole) - Fire can purify water, cook food, signal rescuers, provide warmth, light, and comfort - Fire can keep predators at a distance - Ways to build a fire - Examples that can be used for tinder (natural & manmade) - How to start a fire without matches	<u>Students will be able to:</u> - Determine proper clothing (layers, materials, quantity) for a variety of environments - Build at least one type of emergency shelter - Procure water using at least two methods - Filter murky water using a make-shift method - Demonstrate a way to purify water - Describe the symptoms caused by waterborne parasites/bacteria and how to prevent contamination - Identify several common wild edible plants to Connecticut - Build a method to trap an animal - Identify several common animals to Connecticut - Demonstrate how to build a fire - Identify materials that can be used as tinder - Describe the steps to start a fire without matches

Significant tasks:

Significant task 1: Shelter

Students can brainstorm what shelter means (anything that protects you from the elements) and why it is important in the wilderness. Clothing is the first form of shelter. Proper clothing and layering for a variety of environments should be discussed. Materials should also be analyzed for effectiveness (waterproof, breathability, warmth). Students could design outfits (both worn and carried in a pack) for a particular season/environment and explain why they chose the clothes/materials. Next, they can discuss what could be used to provide shelter during a variety of scenarios (paracord, mylar blanket, poncho). They can create a list of items that would be useful to carry in case one needs to build a survival shelter. Groups of students can then build a variety of shelters such as a tarp shelter, lean-to, and an A-Frame shelter.

Timeline: ~3 classes @ 75 minutes

Significant task 2: Water

Students can begin by hypothesizing how much water a human needs a day and all the ways that water is lost through body mechanisms. They can then research the answers to see how close their ideas were. Once they comprehend that water is essential and the first thing that should be located in a survival situation, they can determine how a drinkable water source can be located (look for lush vegetation, swarms of insects, animal tracks). Since a water source is not always readily available, students should build devices such as a solar still and/or a transpiration bag to procure water. Often water from emergency sources is full of sediment and debris so students can build a make-shift filter. Finally, students should learn about various water-borne bacteria and parasites such as giardia and cryptosporidiosis, and the symptoms they cause. Since bacteria can not be removed from a make-shift filter, students should research how to purify water using methods such as boiling, bleach, and iodine.

Timeline: ~3 classes @ 75 minutes

Significant task 3: Food

Flora

Students could begin by watching the last few minutes of *Into The Wild*, a book that is often read in English 12. They could analyze how one simple oversight in plant identification leads to death. It is imperative that students learn they should not consume any plant (mushrooms included) unless they are 100% certain of its identification. Students can research common edible plants found in southeastern Connecticut. Their findings can be shared with the class and then they could walk the school grounds looking for the plants. Simple foods such as stir fry, dips, or teas could be made and tasted.

Fauna

Students can discuss why physically hunting for food would not be the best idea in a survival situation. They can research and build multiple trapping methods to procure food such as primitive and modern trap techniques with deadfalls, snares, and body traps. Learning how to build and use a simple spear and fishing pole are also useful for procuring food. Students can discover common animals around Connecticut that can/are often hunted/consumed.

Timeline: ~5 classes @ 75 minutes

Significant task 4: Fire

After a discussion of why fire would be useful in a survival situation (cook food, signal rescuers, provide warmth, light, protection from predators, and comfort) , students can talk about what would be needed to build and start a fire. Different types of wood can be mentioned and most importantly tinder can be emphasized. Students can go outside and find various types of tinder such as birch bar, dry grass, dead pine needles and cattail down. Students can be asked what they could use if no natural tinder was available. They can research what survivalists use and then procure some such as vaseline saturated cotton balls, dryer lint, cardboard, and paraffin wax. Fire starting methods, besides matches, can be demonstrated either by the teacher or through video resources. Depending on the class situation, students could practice building and starting fires using various sources (magnesium, flint) and methods.

Timeline: ~2 classes @ 75 minutes

Common Learning Experiences:

- Opportunities to Respond
- Field work
- Performance based scenarios
- Cooperative Grouping
- Scientific Discourse
- Science and Engineering practices
- Computer simulations
- Developing a Driving Question Board
- Form claims based on evidence and reasoning
- Exit Tickets
- Concept Quizzes

Key vocabulary:

- Gore tex, polypropylene, mylar, paracord, A-Frame, tarp, Giardia, cryptosporidiosis, tinder, magnesium, sorrels, deadfalls, snare, tinder, accelerant

Evidence of Understanding - Common Assessments

- Clothing Scenario
- Shelter Building
- Water Procurement Method Activity
- Water Filter & Purification Demonstration
- Edible Plant Matching
- Animal Trap Method
- Fire Building Assessment

Teacher notes:

- Resources:
 - <https://thesurvivaluniversity.com/survival-tips/wilderness-survival-tips/all-things-water/water-in-the-wild/>
 -
- Anticipated Student Misconceptions:
 - Blood, Urine, Fish juices, Salt water, Alcohol, and Fresh sea ice can be consumed when there is no viable water.
 - Starting a fire with friction is easy.
- Differentiation Strategies:
 - NGSS Appendix D - "All Standards, All Students":
[Making the Next Generation Science Standards Accessible to All Students](#)
 - [Tier 1 Universal Strategies](#)
 - [Tier 2 Targeted Strategies](#)
 - [Tier 3 Intensive Strategies](#)
- Safety Considerations:
 - Ensure students comprehend the dangers of eating unknown foods.
 - Practice fire safety measurements
- Prior Knowledge:
 - Some students may have knowledge of the concepts through scouting or family experiences.
- Interdisciplinary Connections:
 - Social & Emotional Standards: CASEL Core Competencies
 - Self-awareness: Know your strengths and limitations, with a well-grounded sense of confidence, optimism, and a growth mindset.
 - Self-management: Effectively manage stress, control impulses, and motivate yourself to set and achieve goals.
 - Social awareness: Understand the perspectives of others and empathize with them, including those from diverse backgrounds and cultures.
 - Relationship skills: Communicate clearly, listen well, cooperate with others, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help when needed.

- Responsible decision-making: Make constructive choices about personal behavior and social interactions based on ethical standards, safety, and social norms”
- Nutritional Information/Needs
 - Biology, Food & Nutrition Exploration, Advanced Health