Title: Trail to Trail: Leave No Trace on the Boulder Face

Abstract/Vignette: Seven Generations Charter School Fifth Graders apply systems thinking to address the issue of vandalism on natural boulder features on local trails. Serving a need of two community partners – The Allentown Hiking Club (managing a local section of the Appalachian Trail about 45 minutes from the school) and the Wildlands Conservancy (managing the South Mountain Trail located adjacent to the school). Taking a systems approach to solving problematic interactions between social and natural systems, the students investigate the costs of vandalism and research restoration options. Students present their research to the group via informational reports and teams work together to develop action plans they will carry out under the guidance of Alison Saeger Panik, fifth grade teacher, Tom Gettings, local environmental activist, Barbara Weimann, TTEC Advisory Board and Allentown Hiking Club member, Blue Mountain Eagle Climbing Club, and the local Wildlands Conservancy. In addition students publish opinion pieces to call the community to action to prevent ongoing issues of vandalism.

Grade level(s): ✅ 3-5

Year Developed: 2013

Period (month long unit vs. week long): Fall Trimester

Teaching environment: ✅ In the Classroom (indoors) ✅ Outdoors
UNIT DESIGN TEMPLATE

<table>
<thead>
<tr>
<th>Stage 1 – Desired Results</th>
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</thead>
<tbody>
<tr>
<td><strong>A. “Big Ideas”</strong></td>
</tr>
<tr>
<td>The high-level ideas, concepts, principles or processes for my TTEC unit include:</td>
</tr>
<tr>
<td>Interdependence</td>
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<tr>
<td>Survive and Thrive</td>
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<tr>
<td>5 Elements of Survival</td>
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<tr>
<td>Maslow’s Hierarchy of Needs</td>
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<tr>
<td>Leave No Trace Principles</td>
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<tr>
<th><strong>B. “Enduring Understandings”</strong></th>
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<tbody>
<tr>
<td>Students will understand that:</td>
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<tr>
<td>• Systems interact and impact other systems.</td>
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<tr>
<td>• Every living thing requires air, water, food, shelter, and space to survive.</td>
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<tr>
<td>• Human needs are different from the needs of other living things; only when a more basic need is met can a higher need be met.</td>
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<tr>
<td>• Humans can protect the environment and enjoy the outdoors responsibly so that other living things can survive and thrive, too.</td>
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<tr>
<th><strong>C. “Essential Question(s)”</strong></th>
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</thead>
<tbody>
<tr>
<td>Students will keep considering:</td>
</tr>
<tr>
<td>• How are natural and social systems interdependent?</td>
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<tr>
<td>• How is a trail a system?</td>
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<tr>
<td>• How do humans impact the five elements of survival on the local trail system? on the Appalachian Trail system?</td>
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<tr>
<td>• What is the difference between surviving and thriving?</td>
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<tr>
<td>• What causes vandalism? How are unmet needs a cause of vandalism? What human needs are “met” through vandalism?</td>
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<tr>
<th><strong>D. Place-based Service Learning Lens (Assumes PBSL Principle #5 Integrated &amp; Principle #6 Rigorous):</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Grounded in Place</strong></td>
</tr>
<tr>
<td>In what ways is your unit a direct reflection of local landscapes, resources, culture, and values?</td>
</tr>
<tr>
<td>Our school is located in a town that is on the south side of a valley bordered to the south by South Mountain and to the north by Blue Mountain, a 150-mile long ridge that forms the eastern part of the Appalachian mountain range. This unit focuses on South Mountain Trail (SMT), a trail that is located at the end of our street, and the Appalachian Trail section that passes through our county, located about 45 minutes from our school. Resources include the local Wildlands Conservancy, the Allentown Hiking Club, Barbara Weimann, TTEC Advisory Board Member and Allentown Hiking Club member, and Tom Gettings, a local environmental activist with experience maintaining the South Mountain Trail and, more specifically, eradicating the damage done to the mountain by vandals.</td>
</tr>
</tbody>
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1 This TTEC planning tool is adapted from Understanding by Design (UbD) from Wiggins & McTighe (1998, 2005, 2011)
Real
What authentic, real-world need or opportunity will students address through their project?
Students will address the issue of trail vandalism.

Empowering
What opportunities exist or can be created for students to have meaningful roles in project design, decision-making, and evaluation?
Opportunities include researching how rock faces on the trails can be restored after they have been spray-painted by vandals, laws regarding vandalism, and the motivations of vandals. Students will make decisions about how we can make a difference in repairing damage done by vandals, take action, and evaluate the effectiveness of their decisions and actions.

Collaborative
What opportunities will students have for mutually beneficial collaboration with other disciplines, community or public land partners?
Students will have the opportunity to learn about both sides of the graffiti issue, stories of graffiti created with art materials on approved surfaces and graffiti's position in the world of art with Jennifer Miller, the art teacher. Students will collaborate with community partners that include the Allentown Hiking Club (and ATC) and the local Wildlands Conservancy group.

E. Content Standard(s): (Assessed standards in bold)
PA Environment & Ecology 4.1.5.F: Understand how theories are developed.
PA Science (Technology & Engineering) 3.4.5.A2: Understand that a subsystem is a system that operates as part of a larger system.
PA Science (Technology & Engineering) 3.4.5.B1: Explain how the use of technology can have unintended consequences.
PA Science (Technology & Engineering) 3.4.5.B3: Describe how community concerns support or limit technological developments.
PA Science (Technology & Engineering) 3.4.5.C1: Explain how the design process is a purposeful method of planning practical solutions to problems.
PA Science (Technology & Engineering) 3.4.5.E2: Understand that there are many different tools necessary to maintain an ecosystem, whether natural or man-made.
PA Geography 7.2.5.A: Describe the characteristics of places and regions.
PA Geography 7.2.5.B: Identify the basic physical processes that affect the physical characteristics of places and regions.
PA Geography 7.4.5.B: Identify the effect of people on the physical systems within a community.
PA Civics & Government 5.1.5.B: Describe the basic purposes of government in the classroom, school, community, state, and nation.
PA Civics & Government 5.2.5.A: Identify individual rights and needs and the rights and needs of others in the classroom, school, community, state, and nation.
PA Civics & Government 5.2.5.B: Identify behaviors that promote cooperation among individuals.
Common Core Reading (Informational Text) CCSS.ELA-Literacy.RI.5.7 on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
Common Core Writing CCSS.ELA-Literacy.W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
Common Core Writing Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
Common Core Writing Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.
Common Core Speaking Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others’ ideas and expressing their own clearly.
Common Core Speaking CCSS.ELA-Literacy.SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Stage 2 – Acceptable Evidence
<table>
<thead>
<tr>
<th>Performance Task(s):</th>
<th>Evaluative Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learners will show that they really understand by:</td>
<td>Informal observation</td>
</tr>
<tr>
<td>Investigation of the issue of vandalism</td>
<td>Observation checklist</td>
</tr>
<tr>
<td>Researching restorative options for vandalism on boulders</td>
<td></td>
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<tr>
<td>Engaging in discussions, small group investigation teams, decision-making processes, and developing an action plan</td>
<td>4-3-2-1-0</td>
</tr>
<tr>
<td>Carrying out restoration of boulders on SMT and ATC</td>
<td>Assessment Points</td>
</tr>
<tr>
<td>Completing reflections demonstrating their discoveries, questions, and understanding.</td>
<td>Report Rubric</td>
</tr>
<tr>
<td>Reporting on a topic related to the issue of vandalism or one part of our research and issue-addressing process, demonstrating understanding of information learned from reading and</td>
<td>Writing Rubric</td>
</tr>
<tr>
<td>Writing an opinion piece with relevant proof of their opinion and action steps for readers.</td>
<td>Content Checklist</td>
</tr>
</tbody>
</table>

Students will know…

- Vocabulary associated with the investigation, including terms used to describe the trails, terms used to explain processes and materials used to remediate vandalism, descriptive words that capture intended meaning when discussing the social issues of vandalism behaviors, etc.

- Maslow’s Hierarchy of Needs

- The 5 Elements of Survival

- How to investigate issues associated with an interaction between natural and social systems

Students will be skilled at…

- Identifying community concerns in terms of systems-thinking solutions.

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<thead>
<tr>
<th>Evaluation Criteria</th>
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<tbody>
<tr>
<td>Informal observation</td>
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<td>Content Checklist</td>
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<tr>
<td>Traditional vocabulary assessment</td>
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<tr>
<td>Reflection References used correctly within spoken, written or visual mode of communication</td>
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<tr>
<td>Informal observation Checklist</td>
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<tr>
<td>Checklist focused on group participation &amp; skills</td>
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<tr>
<td>Supporting a viewpoint with evidence.</td>
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<tr>
<td>Working collaboratively and cooperatively to solve a problem.</td>
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<tr>
<td>Designing and carrying out a solution to a problem.</td>
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### Other Evidence:

*Students will show they have achieved Stage 1 (Desired Outcome) goals by…*

- **Pre-assessment pieces include:**
  - Systems survey (to determine prior access to systems-thinking)
  - Systems circles
  - Informal observation in discussions and investigations
- **Formative assessments include:**
  - Individual reflections (Big Ideas)
  - Hands-on group assessment of understanding of the 5 Elements of Survival & Maslow’s Hierarchy
  - Literature Circle responses (evidence of understanding and application of Big Ideas)
  - Quiz of Leave No Trace Principles
  - Written portions of informational report and opinion piece in process
- **Completing a written (or otherwise published) report/opinion piece describing**
  - Interdependence on the SMT/ATC
  - How humans impact the 5 elements of survival on the SMT/ATC
  - The difference between surviving and thriving
  - The causes of vandalism
  - Ways to confront the issue of vandalism on the SMT/ATC
- **Delivering information about vandalism to an authentic audience** (schoolmates, staff, parents, school and town community at EIC at Seven Gen Open House, local hiking clubs, etc.) that educates others about vandalism and how...
  - Systems interact and impact other systems.
  - Every living thing requires air, water, food, shelter, and space to survive.
  - Human needs are different from the needs of other living things; only when a more basic need is met can a higher need be met.
  - Humans can protect the environment and...
enjoy the outdoors responsibly so that other living things can survive and thrive, too.

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<th>Learning Activities (includes timing, supplies, &amp; links):</th>
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<td><strong>Pre-Fieldwork Lessons:</strong></td>
</tr>
<tr>
<td>- Systems Lessons</td>
</tr>
<tr>
<td>- What is a System?</td>
</tr>
<tr>
<td>- Self (body), Classroom, School, Town, Trail</td>
</tr>
<tr>
<td>- Systems Interactions &amp; Interdependence</td>
</tr>
<tr>
<td>- <em>Hatchet</em> by Gary Paulsen book group</td>
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<tr>
<td>- 5 Elements of Survival Lesson</td>
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<tr>
<td>- Leave No Trace Principles</td>
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<tr>
<td>- Leave No Trace 101: Who Will Survive</td>
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<tr>
<td>- Maslow’s Hierarchy Bracelet Hike</td>
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<tr>
<td>- Intro to the ATC</td>
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<td><strong>Fieldwork-Specific Lessons:</strong></td>
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<td>- Leave No Trace 101: Wall of Shame</td>
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<td>- The Art of Graffiti (with Jen Miller, Art Specialist)</td>
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<tr>
<td>- The Other Side of Graffiti (with Gary Warren)</td>
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<td>- Vandalism Hike &amp; Town Walk</td>
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<td>- First Fall ATC Hike</td>
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<td>- Student-Led Service Learning Project Design</td>
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<td><strong>Projected steps:</strong></td>
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<td>- Investigation: The Costs of Vandalism</td>
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<td>- Investigative Reports Sharing (Informational Writing and Presentations – Oral, visual, student-choice)</td>
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<td>- Small teams research cleaning and beautification solutions (interviews, online research, experimentation)</td>
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<td>- Celebrate &amp; Reflect</td>
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<td><strong>Post-Fieldwork Lessons:</strong></td>
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<tr>
<td>- Preventing Vandalism</td>
</tr>
<tr>
<td>- Discussion Vandalism through the Maslow’s Hierarchy of Needs lens</td>
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<tr>
<td>- Writing opinion/call to action pieces to accompany informational writing</td>
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<tr>
<td>- Authentic audience presentations &amp; publications (small group and/or individual)</td>
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</table>

**Interdependence**

**Survive and Thrive**

**5 Elements of Survival**

**Maslow’s Hierarchy of Needs**

**Leave No Trace Principles**

Humans can protect the environment and enjoy the outdoors responsibly so that other living things can survive and thrive, too.

**What causes vandalism?**

How are unmet needs a cause of vandalism? What human needs are "met" through vandalism?

**Adaptations**

**Progress monitoring through pre-assessments, simulations, formative & summative assessments**
Learner-centered and context-sensitive adaptations for our TTEC unit include:

Modified assessments
**Systems Circles:** assist with cutting and assembly as needed; allow students to use words and drawings to portray systems at each level

**Reflections and Literature Circle Responses:** students with writing challenges may choose to record reflections using voice memo or dictation software or dictate to a teacher or peer

**Presentations & Publications:** Students will be given a choice of modes for presenting information about vandalism to an authentic audience, including but not limited to:
- written brochure, flier, report;
- oral presentation, skit, video,
- kiosk display
- PowerPoint or Prezi,
- photo slideshow,
- song, poem, or rap
- game
- artwork (painting, poster, sculpture, diorama)
- ad campaign
- sign or billboard

Extended time will be offered on
Quiz of Leave No Trace Principles
Written reflections, research, and reports
Presentations & publications

Extended opportunities for motivated students
See list of presentations & publication.
Students create multiple presentation pieces independently or collaboratively.

**Reflections**

Post-instruction reflections by TTEC unit designer(s)/instructor(s) include:

HEAD + HEART + HANDS

Head –
While I thought I already had a firm understanding of place-based service learning prior to my participation in TTEC, the experience completely broadened my grasp on the foundations of place-based education and inspired me to expand beyond the community immediately surrounding my school to include the local Appalachian Trail. This wider look at “community” helped solve an issue I saw in my school’s community-based approach – how to include the world outside of Emmaus in our students’ learning experiences. Incorporating the Appalachian Trail provided the perfect connection to U.S. Geography standards, making them easy to integrate as we look at how our local part of the trail connects us to 14 states on the east coast. I see lots of room to expand on this geography connection next year when we repeat this unit, perhaps with a different or modified service learning focus, depending on student interest.

Through TTEC I’ve learned that place-based service learning is more than just the narrower EIC (Environment as an Integrating Context) approach that we use at my charter school. The TTEC
curriculum design model integrates outcomes, assessment, and instruction in a way that the EIC template used at my school does not. It helped me to concretely identify the results I want to see and the evidence of those results right up front. It helped me to plan out and visualize learning experiences that would support the results and evidence very clearly. And my favorite part was the identification of "Big Ideas". This is what my school is all about, yet it is missing from our EIC template completely. The TTEC curriculum design model place the Big Ideas in the forefront where they belong.

Not only did I learn about PBSL and a new (better) way to approach my units, but I also learned a lot about the Appalachian Trail, Leave No Trace Principles, and graffiti vandalism. Besides acquiring knowledge of the amazing history about and management of the AT, I have also become really interested in the culture of the Appalachian Trail. Small glimpses of the traditions, language, and "ways" of AT hikers have intrigued me and make me want to take a look at the trail through a cultural anthropology lens. Looking at communities as a system with components, processes, and functions is part of what we do at my school and the AT community, stretching across 14 states and including members from the world community, is a very unique population with interesting possibilities for further study with my students (or even on my own). It was a surprising discovery for me.

Leave No Trace Principles were familiar to me, but after TTEC, they’ve become a foundation for my Trimester 1 survival unit. We apply these principles not only to the trails, but also to our own school property – both indoors and outdoors. I have advocated for educating children at all grade levels about Leave No Trace at my school. And my own personal attitude toward nature and trails have changed because of my work with Leave No Trace. My belief that nature is our playground began as a child playing in creeks, streams, and forests, digging, climbing, running through what I now see are habitats! Many in my school community (particularly parents) believe that natural spaces are places for children to dig, uproot, jump, run, etc. without regard for the living things that are in those spaces. Last year my students undertook a place-based service learning project to turn a wild space on our school property into a mini wildlife sanctuary. They mapped out and cleared a trail, mulched it on their own, and purchased signs with Leave No Trace-based rules on them. (Thanks to the April TTEC weekend I was armed with LNT!) But families in our community have fought to allow their children to run wild in the sanctuary, which has created some tension between my students and our staff and the families who hang out by the creek after school. Educating families about Leave No Trace will be an ongoing challenge for our school.

My unit, Leave No Trace on the Boulder Face, has been an empowering, authentic experience for my students and for me, too. I’ve learned that graffiti is a very controversial topic. Many in the art world view it with esteem, as do many of our urban middle school students. Defining graffiti as vandalism is not universal and there are many who challenge the notion that it is a crime. Taking a critical look at the issue has cultivated our systems thinking process for sure! As we look at components, processes, and the intended function/purpose of the trails, we firmly believe that graffiti on the trail is vandalism and detracts from the enjoyment of hiking the AT and our South Mountain Trail. Taking on this issue boosted my students’ engagement (as evidenced by unit engagement and enthusiasm surveys) and is enabling my students to make a real, tangible contribution to resolving a major local environmental issue. In addition, we’ve made some strong, new ties to community organizations and within our own school as we’ve shared about this issue with the entire school community.

Seeking a method for graffiti removal/boulder restoration has provided us with authentic learning opportunities. Gathering data about each method, asking critical questions, and making decisions are skills all students will use as they solve problems throughout their lives. Being mindful of ecological results, economic costs, and personal energy expenditure have helped children
understand that simple solutions sometimes aren’t as simple as they at first appear. In addition we used math skills and technology to measure the distance from the boulders to the nearest access road to determine whether or not the power washer hoses could reach the boulders. We did unit conversions to calculate this distance and also determined how many 400 foot hoses would be needed. Working with money and making changes as well as budgeting the money earned from our cookie sale also allowed us to apply math skills to real life. Writing informational and persuasive pieces about graffiti put our writing skills to use. Our speaking skills were used to present information (and informally gather information) while introducing the graffiti vandalism issue we are working on to other students and to the community. My students presented to the middle school, the elementary school, and to family and community members at our place-based education showcase night in December. And of course we read and read about graffiti vandalism – news articles, research results, reports, and stories, using reading strategies to learn as much as we could about graffiti.

HEART
I feel very proud of my students and the work we’ve done so far. I feel connected to our mountain and to the AT – a kind of ownership, not just an “I’m just a visitor here” feeling. Authenticity is important to me and whenever I can create learning opportunities for my students that are real and authentic (not just “complete this worksheet for a grade”), it makes me happy. I feel like I myself am making a difference in the world by inspiring children to do something about the problems they see. I am overjoyed by their investment in this project and their enthusiasm for it. Usually I let the children choose their own first trimester service learning project, but this year I had the TTEC opportunity which meant that I had to kind of steer them in the direction of graffiti on the boulders. They needed only an invitation to get on board they immediately activated to get behind the issue. Watching them work and discover has been a pleasure. They totally own those boulders now that they’ve taken the time to touch them and work on them to clean off the vandalism. When trying the chisel method, one student accidentally chipped several pieces off of one of the boulders. The children were rather upset and work stopped as they discussed the damage they could be doing to something so old. One student said, “Rocks can’t grow back the parts that come off.” They all agreed that, although the chisels were fun to use, they were making a permanent change in nature, a result that is in direct opposition to “leave no trace and this method was rejected. They felt compassion for nature and for the future generations who would be enjoying these boulders and did not want to impact even one little chip off of the big boulder.

HANDS
We still have work to do on this project. This month we investigated and testing three different methods for graffiti removal – creative disguise (spray painting over the graffiti so it looks like rock), wire brushes, and chisels. We measured, tested on small boulders, and discussed environmental impacts and use of resources. We acknowledged that have a limited budget (raised via a student-led cookie sale), limited time, and (realistically) limited abilities. We also realize that the weather is a factor that impacts methods. We planned three full-day hikes in December to do our testing and then actually perform our restorations on the South Mountain boulders, hoping for mild weather. However we are temporarily at a stopping point as the weather has turned too cold to use two of our choice methods – creative disguise and “The World’s Best Graffiti Remover”. This gives us time to meet with both of the local AT clubs this winter to find out more about their graffiti removal efforts (we’ve already met with Allentown; we have been unable to connect with Blue Mountain, but still trying) and to ask permission to take our families to Bake Oven Knob for a restoration project on a Saturday morning in spring. Similarly, last year’s fifth grade did the backwork on their wildlife sanctuary project in the fall, then built the trails in the spring. We look forward to fulfilling our goal of
restoring the boulders both on South Mountain and the AT this spring. And we will be on the lookout for mild weather spells that could allow us to get the job done even sooner. All of the materials have been purchased, so we are ready to move!

The other outcome of Leave No Trace on the Boulder Face is the enduring understanding of the permanency of graffiti vandalism and the importance of respecting the property of others. My students have taken ownership of this issue and have spread the word throughout our school community. Stewardship is one of our school's core values. They believe they are environmental stewards and that they are fulfilling our school's mission and vision. The name of our school comes from a statement made by local native Americans many generations ago. And with this service learning project this generation is looking ahead to preserve nature for generations to come.

"In our every deliberation, we must consider the impact of our decisions on the next seven generations." - Great Law of the Iroquois Confederacy
# A Trail to Every Classroom (TTEC) Unit Design Overview Chart

## Stage 1 – Desired Results

<table>
<thead>
<tr>
<th>Big Idea(s):</th>
<th>Interdependence, Survive and Thrive, 5 Elements of Survival, Maslow's Hierarchy of Needs, Leave No Trace Principles</th>
</tr>
</thead>
</table>
| Enduring Understanding (s) | Systems interact and impact other systems.  
Every living thing requires air, water, food, shelter, and space to survive.  
Human needs are different from the needs of other living things; only when a more basic need is met can a higher need be met.  
Humans can protect the environment and enjoy the outdoors responsibly so that other living things can survive and thrive, too. |
| Essential Question(s): | How are natural and social systems interdependent?  
How is a trail a system?  
How do humans impact the five elements of survival on the local trail system? on the Appalachian Trail system?  
What is the difference between surviving and thriving?  
What causes vandalism? How are unmet needs a cause of vandalism? What human needs are “met” through vandalism? |

| Content Standard(s): | PA Science 3.4.5.A2, PA Science 3.4.5.B3, PA Science 3.4.5.C1, PA Geography 7.4.5.B, PA Civics & Government 5.2.5.A, Common Core Reading CCSS.ELA-Literacy.RI.5.7, Common Core Writing CCSS.ELA-Literacy.W.5.1, Common Core Speaking CCSS.ELA-Literacy.SL.5.4 |

## Place-based Service Learning Lens (Assumes PBSL Principle #5 Integrated & Principle #6 Rigorous):

**Grounded in Place**

*In what ways is your unit a direct reflection of local landscapes, resources, culture, and values?*

- Sites include nearby South Mountain Trail and ATC trail about 45 minutes from our school.
- Local community partners include Wildlands Conservancy and Allentown Hiking Club
- Project addresses a community issue

**Real**

*What authentic, real-world need or opportunity will students address through their project?*

- Students will address the issue of trail vandalism.

**Empowering**

*What opportunities exist or can be created for students to have meaningful roles in project design, decision-making, and evaluation?*

- Students research restoration options, laws regarding vandalism, and the issue of vandalism
- Students make decisions, identify steps and take action
- Students evaluate the effectiveness of their decisions and actions.

**Collaborative**

*What opportunities will students have for mutually beneficial collaboration with other disciplines, community or public land partners?*

- Art of graffiti with art specialist
- Opportunity to meet community partner needs in collaboration (Allentown Hiking Club/ATC and local Wildlands Conservancy)

## Stage 2 – Assessment Evidence

**PBSL Performance Task(s):**

- Action plan based on research
- Conducting restoration project

**Other Evidence:**

- Written information/opinion piece about vandalism
- Publication/presentation for authentic audience

## Stage 3 – Learning Plan

**Learning Activities:**

- Pre-Fieldwork Lessons (Systems, Survival, Leave No Trace & Maslow's Hierarchy)  
  Fieldwork-Specific Lessons  
  Leave No Trace 101: Wall of Shame  
  The Art of Graffiti (with Jen Miller, Art Specialist)  
  Vandalism Hike & Town Walk  
  First Fall ATC Hike  
  Student-Led Service Learning Project Design

**Projected steps:**

- Investigation: The Costs of Vandalism  
- Investigative Reports Sharing (Informational Writing and Presentations – Oral, visual, student-choice)  
- Small teams research cleaning and beautification solutions (interviews, online research, experimentation)  
- Implement solutions on South Mountain Trail and the ATC (Second Fall ATC Hike)  
- Celebrate & Reflect  
- Post-Fieldwork Lessons  
  - Preventing Vandalism  
  - Discussion Vandalism through the Maslow’s Hierarchy of Needs lens  
  - Writing opinion/call to action pieces to accompany informational writing  
  - Authentic audience presentations & publications (small group and/or individual)
Lesson Plans
Note: Timing of each lesson is anywhere from one day to 2 weeks.

### Introduction: What is a System?

<table>
<thead>
<tr>
<th>Essential Question: What is a System?</th>
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**Lesson Objectives:**
- Students will define “system”.
- Students will identify systems they are familiar with.
- Students will describe components and processes of a familiar system.
- Students will diagram a familiar system as a class, with a small group, with a partner, and independently.
- Students will construct a systems circle.

**Learning Activities:**
- Students define and explore familiar systems and create basic visual diagrams of how systems function.
- Students work as a class, in small groups, with partners, and on their own. Students create a concentric circle diagram/artwork that demonstrates understanding of the systems of which they are a part and how subsystems are a part of larger systems.

---

**Lesson 1 “How am I a System?”**

**Standards-based learning objective(s):**
- Students will diagram and label major body organs and the systems of the human body.
- Students will identify the food groups and nutrition messages that make up the food guide pyramid and learn how to choose healthier foods from each food group.
- Students will investigate the systems of the human body, drawing on information from multiple sources to locate answers to their self-generated questions.
- Students will apply their knowledge of fractions, multiplication, and division to solve problems involving healthy recipes, physical challenges, and data from student-led surveys and investigations.

**Context-based Learning objective(s):**
- Students will identify the components and processes of the human body.
- Students will diagram human body systems and assess how their functions affect the performance of the whole human body.
- Students will give examples of how the human body meets its needs by using behaviors in response to stimuli.
- Students will discuss how each human body is a natural resource for other systems.
- Students will identify and diagram the component parts of food webs that support their healthy lifestyles.
- Students will identify the food groups and nutrition messages that make up the food guide pyramid and explain how they will choose healthy foods from each food group.
- Students will cooperate on partner and team projects.
- Students will demonstrate conflict resolution skills.

**Adopted Instructional Materials and Other Resources:**
- Uncover the Human Body: An Uncover It Book by Luann Colombo
- Educational Insights Inside-Out Lenticular Human Body Posters
- 4D Vision Cranial Nerve Skull Anatomy Model
- Bill Nye the Science Guy human body video clips

**Summary Description:**
Students will investigate and diagram the major organs and systems of the human body. They will discuss how the human body meets its needs and explore nutrition resources. Students will gather a variety of data related to their own human bodies and the health and nutrition habits of schoolmates.

Students will generate their own questions about the human body and pursue their own answers using a variety of resources including their own research. A variety of cooperative learning strategies will be employed to enable to students to work together to construct their own knowledge. Students will publish their “expertise” in written articles and illustrations for a class health magazine. A visit to Rodale to meet with the editors of Prevention and Men’s Health to be scheduled...

Responsible individual(s):

Classroom teachers
Health teacher
Lesson 2 “How are We a System?”

Standards-based learning objective(s):
- Students will observe, diagram, and write about their ideal classroom system.
- Students will gather data (about classmates, classroom and school systems, the town and the nature preserve), express data as fractions, and answer questions by mathematically manipulating this data.
- Students will explore the concept of sharing resources by defining and interpreting fraction data as division.
- Students will state the purpose of government in the classroom, school, and community.
- Students will identify behaviors that promote cooperation among classmates.
- Students will outline different ways conflicts can be resolved.
- Students will recognize how students in our class meet some of their needs in our classroom environment by using behaviors in response to stimuli.
- Students will diagram the classroom system, identifying components, processes, and interactions.
  - Students will recognize how students in our class meet some of their needs in our classroom environment by using behaviors in response to stimuli.
- Students will give examples of classroom conflict situations and appropriate strategies to avoid or resolve these conflicts.

Context-based Learning objective(s):
- Students will observe, diagram, and write about their ideal classroom system.
  - Students will identify the needs and purposes of our classroom, how they are determined and how they are met.
- Students will diagram the classroom systems, identifying components, processes, and interactions.
  - Students will recognize how students in our class and other classes meet some of their needs in our classroom environment by using behaviors in response to stimuli.
- Students will investigate how shared responsibility and stewardship affect the classroom.
  - Students will state the purpose of government in the classroom.
  - Students will identify behaviors that promote cooperation.
  - Students will outline different ways conflicts can be resolved.
  - Students will develop an efficient decision-making process.
  - Students will outline safe practices in the classroom.
- Students will successfully demonstrate the following social skills that promote positive teaming:
  - Listening
  - Asking for Help
  - Expressing Gratitude
  - Being Prepared
  - Following Instructions
  - Completing Tasks
- Students will observe, diagram, and write about their ideal classroom systems and share ways they will be a part of this successful system.
- Students will reflect on and discuss opinions mindfully.
- Students identify their rights and explore how their needs are met.

Adopted Instructional Materials and Other Resources:

| The Seven Gen website
| "Survival 101"/Skillstreaming the Elementary School Child by Ellen McGinnis and Arnold Goldstein |

Summary Description:
Students will investigate the classroom as a system. They will explore the EIC model, the Seven Gen vision and mission, and the core values of our charter school and interpret them in kid language. The fifth grade will work collaboratively to identify the subsystems within a classroom community then break
into small teams to observe the components, processes, and functions of these subsystems at different grade levels within our school. Students will compile their observations to create a presentation for the entire school community. Students will publicize their learning via several different means of expression that include:

- School community-wide strategic planning "state-of-the-school" meeting
- All-School Morning Meeting (for Seven Gen kids)
- School website video (for the world)
- Written publication (for the future)
- Artistic representations (visual and/or musical expressions)

<table>
<thead>
<tr>
<th>Responsible individual(s):</th>
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<tbody>
<tr>
<td>Seven Gen classroom teachers (permitting student observers)</td>
</tr>
</tbody>
</table>
Lesson 3 “How is Seven Generations a System?”

Standards-based learning objective(s):

- Students will conduct a short research project investigating different aspects of our school, its founding, its history, and how it runs as a system today.
- Students will interpret data regarding recycling and waste in the school.
- Students will recognize how other members of our school system respond to stimuli, i.e. cold temperatures in the building, overstimulation, excessive noise, quiet times.
- Students will state the purpose of government in the school i.e. board of trustees, community circle, committees, and governing by consensus.
- Students will identify behaviors that promote cooperation among students.
- Students will outline different ways conflicts can be resolved.
- Students will compare specific ways individuals participate in activities at Seven Gen.
- Students will outline safe practices in a variety of school-related settings (classroom, hallway, bathroom, MPR, special subject classrooms, playground, beehive, creek, sidewalks, hiking trails).

Context-based Learning objective(s):

- Students will describe the subsystems that operate as part of our larger school system.
  - Students will identify the needs and purposes of each of these systems, how these are determined and how they are met.
  - Students will explain their individual part in each of these systems.
  - Students will discuss the role of our classroom community in each of these systems.
- Students will list, compare, and discuss individual rights and individual needs.
- Students will diagram our school system identifying components, processes, function, and interactions.
  - Students will recognize how other members of our school system respond to stimuli (see above).
  - Students will conduct a short research project investigating the components and processes of our school system (above).
  - Students will diagram how waste is, is not, and could be recycled in the school.
- Students will investigate how shared responsibility and stewardship affect the school.
  - Students will develop an efficient decision-making process.
  - Students will outline safe practices in a variety of school-related settings (classroom, hallway, bathroom, MPR, special subject classrooms, playground, beehive, creek, sidewalks, hiking trails).
- Students will identify how they will each take personal responsibility for a service learning project that will impact the school, town, or trail.
- Students will demonstrate understanding of safe practices in the following school-related settings: classroom, hallway, bathroom, MPR, special subject classrooms, playground, beehive, creek, sidewalks, and hiking trails.

Adopted Instructional Materials and Other Resources:

Seven Generations Charter School Website

Summary Description:

Beyond our classrooms, what systems help Seven Gen function? Students will investigate the systems in place that make our school days happen. They will interview staff members, take photographs, draw diagrams, and write short reports on their observations of the subsystems within our larger school system.
Lesson 4 “How are we a part of the town system?”

Standards-based learning objective(s):

- **Students will describe the subsystems that operate as part of the town system.**
- Students will spell content-specific and grade-appropriate words correctly, including names of classmates and teachers, *Seven Generations Charter School, Emmaus, Pennsylvania*, body systems, body organs, food groups, *Minor Street*, and other unit words.
- Students will explore the concept of sharing resources by defining and interpreting fraction data as division.
- Students will interpret data (presented as fractions) regarding recycling and waste in the town by applying their understanding of multiplication and fractions.
- Students will recognize stimulus-response in the town.
- Students will diagram how waste is, is not, and could be recycled in the community.
- Students will state the purpose of government in the community.
- Students will compare specific ways individuals participate in activities in the town of Emmaus.

Context-based Learning objective(s):

- **Students will describe the subsystems that operate as part of our larger town system.**
- Students will diagram the town system, identifying components, processes, and interactions.
  - Students will identify the needs and purposes of each of these systems, how these are determined and how they are met.
  - Students will recognize stimulus-response in the town.
  - Students will diagram how waste is, is not, and could be recycled in the community.
  - Students will explain their individual part in each of these systems.
  - Students will discuss the role of our classroom and school community in this system.
- Students will state the purpose of government in the classroom, school, and community.
- Students will list, compare, and discuss individual rights and individual needs.
- Students will describe the subsystems that operate as part of our larger school system, town system, and natural systems.
- Students will list, explore, and discuss environmental factors that could affect our health.

Adopted Instructional Materials and Other Resources:

- Emmaus Main Street Program (Teri Madison, contact person)
- Current Map of Emmaus

Summary Description:

Students will investigate what makes the town of Emmaus a system. Students will brainstorm the general components of a town and the processes that are in place to enable the town’s citizens to meet their individual needs. Students will explore the community to gather information about this specific town, how the town is laid out, and what the town offers its citizens. Students will interview key members of the town community to discover the purposes of different systems, including the town library, post office, police department, main street manager (local network of businesses), and borough government.
Lesson 5 Five Elements of Survival & Maslow’s Hierarchy of Human Needs

Learning objective(s):
Students will explain the terms “environment”, “habitat”, “needs”, and “survival”.
Students will identify and describe the five elements of survival.
Students will correctly select the environmental elements necessary for the survival of a particular animal or plant.
Students will discover Maslow’s Hierarchy of human needs on an interactive hike.

Adopted Instructional Materials and Other Resources:
Bronx Zoo “Elements of Survival” lesson
Maslow’s hierarchy of needs (printable hierarchy in the classroom page)

Summary Description:
On Day 1 of the “Elements of Survival” lesson, students will learn/review living and non-living components of a habitat and identify elements needed for living things to survive. This lesson will also be reproduced on day 2 outside of the classroom with a focus on living things in the local ecosystem.

On Day 3 students will explore Maslow’s hierarchy of needs on a hike through the trail system. Along the hike, we will open numbered envelopes, revealing the next level of needs. Each child will also get a color-coded piece of yarn to add to their wrists to represent that level of need. The cards in the envelopes will be displayed in the classroom for use as a reference when reading literature, discussing social systems, and investigating global issues. This list will also be a reference for use in the Seven Generations Ago and Celebrate America units.
### Lesson 6 “How are we a part of the natural system?”

#### Habitat Studies

<table>
<thead>
<tr>
<th>Standards-based learning objective(s):</th>
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<tbody>
<tr>
<td>Students will describe how organisms meet some of their needs in an environment by using behaviors in response to information received from the environment.</td>
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<tr>
<td>Students will describe the roles of producers, consumers, and decomposers within a local ecosystem.</td>
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<tr>
<td>Students will describe different food webs including a food chain containing humans.</td>
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<tr>
<td>Students will explain the difference between threatened, endangered and extinct organisms.</td>
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<tr>
<td>Students will compare and contrast the similarities and differences in life cycles of different organisms.</td>
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<thead>
<tr>
<th>Context-based Learning objective(s):</th>
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<tbody>
<tr>
<td>Students will evaluate several local natural habitats including our schoolyard natural area, natural areas at the local community park, and on the South Mountain conservancy land.</td>
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<tr>
<td>Students will investigate how the local habitat provides the five elements of survival for 5 different native animals.</td>
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<tr>
<td>Students will diagram and describe how they themselves impact the local natural system and how they benefit from it.</td>
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#### Adopted Instructional Materials and Other Resources:

<table>
<thead>
<tr>
<th>Project Wild</th>
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<tbody>
<tr>
<td>Pennsylvania Environmental Curriculum</td>
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<thead>
<tr>
<th>Summary Description:</th>
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<tbody>
<tr>
<td>Students will engage in several habitat studies, identifying living and nonliving components within each habitat, identifying the presence of the five elements of survival for squirrels, foxes, dear, monarchs, and owls.</td>
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<tr>
<td>Study 1: School campus</td>
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<tr>
<td>Study 2: Gateway Trail</td>
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<tr>
<td>Study 3: Emmaus Community Park</td>
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</tbody>
</table>
Lesson 7 “How can changes in subsystems affect change in larger systems?”

Leave No Trace Principles

Standards-based learning objective(s):
- Students will explain how a subsystem is a system that operates as part of a larger system.
- Students will identify the effects of people on the physical systems within a community.
- Students will determine how the human use of a product or system creates positive or negative results.
- Students will discuss and interpret Leave No Trace Principles.

Context-based Learning objective(s):
- Students will diagram systems within larger subsystems within our local natural and local community.
- Students will generate a list of ways subsystems can change and affect larger systems.
- Students will evaluate the list to determine ways they can create positive change within subsystems that can make a consequent positive impact on a larger system.
- Students will apply Leave No Trace principles to the systems with which we interact, particularly the trail systems and the Seven Gen Wildlife Sanctuary.

Adopted Instructional Materials and Other Resources:
- Leave No Trace 101 (Center for Outdoor Ethics)

Summary Description:
- This part of our unit is the natural conclusion of all of our systems investigations and leads naturally to our service-learning piece. Initially we brainstorm a list of concerns (negative impacts on systems) that we see in our community at the start of the unit. As we progress through our studies of systems at different levels we add to this list. At the end of the unit we re-evaluate our list in terms of system dynamics to determine how we want to make a difference in the world today. The interactions we consider involve ways that humans impact the outdoors and the ways that the natural systems impact human systems.
- Leave No Trace Principles are introduced and interpreted in “kid language”, in terms of hiking on our trails and using our wildlife sanctuary, and also in terms of how we interact with our classroom and school environments. Lesson 089 “Who Will Survive?” provides a learning activity for discussion of human-wildlife interactions.
- Students create Leave No Trace posters for display in the school and prepare an All-School Morning Meeting presentation to share these principles with the school community.
**Lesson 8 Wall of Shame: “Rock Art”**

**Standards-based learning objective(s):**

| Students will identify individual rights and needs and the rights and needs of others in the classroom, school, community, state, and nation. Students will identify behaviors that promote cooperation among individuals. |

**Context-based Learning objective(s):**

| Students will discover the complicated issue of graffiti. Students will understand the value of minimizing handling and vandalism of rock art in the backcountry. Students will experience creative and destructive behaviors and emotions related to leaving heritage resources where they find them as they find them. Students will reflect on the principle of “Leave What You Find”. |

**Adopted Instructional Materials and Other Resources:**


**Summary Description:**

**Before and after recess activity or before and after special. Share slideshow of rock art, petroglyphs, pictographs, etc. and symbols that were used. Invite children to make their own “rock art” on chart paper on the classroom wall. Share and celebrate their designs before recess. During recess vandalize their “rock art” with spray paint. When they return allow the natural reactions and discussions to take place. Share slideshow of graffiti on Bake Oven Knob and graffiti on petroglyphs as well as “Thieves of Time” video clip.**
Lesson 9 Meet the Appalachian Trail

Standards-based learning objective(s):
- Students will identify the tools and processes used to maintain the Appalachian Trail ecosystem.
- Students will describe the characteristics of places and regions along the Appalachian Trail.
- Students will compare and contrast the physical characteristics of the Appalachian Trail with the physical characteristics of South Mountain Trail.
- Students will identify the effects of people on Bake Oven Knob (AT) and compare them to the effects on the boulders on South Mountain.
- Students will apply their understanding of the basic purposes of government in the classroom, school, community, state, and nation to the laws and regulations that protect and preserve trails.

Context-based Learning objective(s):
- Students will use maps to locate the Appalachian Trail and South Mountain Trail.
- Students will compare the trails.
- Students will label their own maps of the Appalachian Trail

Adopted Instructional Materials and Other Resources:

TTEC AT Overview

Summary Description:
Students explore the giant map of the Appalachian Trail and smaller trail maps to discover the trail from a geography perspective. Students generate questions about the trail then research and read about the trail to find answers. Teachers share their experiences with the AT and invite students, parents, and community volunteers to share photos and stories.

Students hike the Appalachian Trail. First an exploration of Bake Oven Knob with discussion and journaling about the graffiti. Then a hike out to the Knife's Edge for lunch and journaling (compare and contrast South Mtn trail with the AT).
Lesson 10 Graffiti Hurts

Standards-based learning objective(s):

| Students will identify the tools and processes used to restore vandalism. |
| Students will describe the effect of people on the physical systems within a community. |
| Students will apply their understanding of the basic purposes of government in the classroom, school, community, state, and nation to the laws and regulations that protect and preserve trails. |

Context-based Learning objective(s):

| Students will reflect on their experiences with and attitudes regarding graffiti. |
| Students will construct concept maps about the graffiti problem. |
| Students will identify the costs of graffiti to communities and the financial consequences to taggers. |
| Students will propose methods and practices that prevent graffiti. |
| Students will compare and contrast characteristics of graffiti, vandalism and art. |
| Students will promote anti-graffiti awareness at Seven Gen. |

Adopted Instructional Materials and Other Resources:

| Graffiti Hurts (Keep America Beautiful, Inc. and Krylon®) |

Summary Description:

| 7 Interactive, interdisciplinary lessons that develop the attributes of respect and responsibility and educate students about the impacts of graffiti on their communities |
Lesson 11 Town Walk and Graffiti Hike

Standards-based learning objective(s):

Students will record detailed observations of vandalism in the local natural and social communities.

Students will describe the effect of people on the physical systems within a community.

Students will apply their understanding of the basic purposes of government in the classroom, school, community, state, and nation to the laws and regulations that protect and preserve trails.

Context-based Learning objective(s):

Students will observe and record information about graffiti in the town community.

Students will observe and record information about the graffiti on South Mountain.

Emmaus: A System of Subsystems

Essential Question: How is the Town of Emmaus a System?

Lesson Objectives:

Students will tour the town to collect observable information about the subsystems, components, processes, and function of a town as a system.

Students will observe and record evidence of graffiti vandalism.

Learning Activities:

- Brainstorm the essential elements of a self-sustaining town system.
- Create a data gathering tables in investigations notebooks indicating the buildings, businesses, services, and housing areas we would to search for as we appraise the town of Emmaus as a self-sustaining town system.
- Take a tour of the town to identify these elements.
- Gather informal observations of graffiti and other vandalism (violations of Leave No Trace) as we walk through the town.

Draw conclusions about the town as a system, including identification of subsystems, components, processes, functions, interactions, and issues.

Graffiti Hike to the Boulders

Essential Questions:

What causes vandalism? How are unmet needs a cause of vandalism? What human needs are "met" through vandalism?

Lesson Objectives:

Students will identify vandalism on the boulders on South Mountain.

Students will gather data about the content and location of vandalism.

Students will document changes since the last visit.

Students will brainstorm possible causes of vandalism.

Students will develop ideas about unmet needs that may be a cause of vandalism, referring to Maslow's Hierarchy of needs.

Students will develop an action plan for solving the multi-faceted problem of vandalism on hiking trails.

Students will actively participate in class discussions.

Learning Activities:

- Vandalism pre-flection - Describe the characteristics of the place of South Mountain in terms of terrain, geography, location.
- Prepare for hike
  - Write data-gathering questions in journal.
  - Arrange research partners
- Plan and prepare (water, shoes, clothing, safety kit)
• Hike to boulders
• Gather data & document changes
  ◦ What tools/technology were used to create the graffiti?
  ◦ What is the content of the graffiti? What kinds of categories could we create to understand the
types and purposes of graffiti?
  ◦ Where is the graffiti located? What makes these locations more graffiti prone than others?
• Pairs brainstorm possible causes of vandalism while on the trail - document in journals
• Hike back to classroom
(see part 2 of lesson in Literacy)
Lesson 12 Student-Led Service Learning Project Design

Standards-based learning objective(s):

Students will record detailed observations of vandalism in the local natural and social communities.

Students will describe the effect of people on the physical systems within a community.

Students will apply their understanding of the basic purposes of government in the classroom, school, community, state, and nation to the laws and regulations that protect and preserve trails.

Context-based Learning objective(s):

see below

Summary Description:

Students brainstorm questions they still have about graffiti vandalism. Students think-pair-share what we can do to make a difference in the world regarding this issue. Ideas are gathered on chart paper/whiteboard. Students develop goals for their service learning and then break the goal into tasks. Student teams are formed depending on the tasks developed. Student teams complete a project plan and calendar. A full project-calendar is created to track all teams. More details below...

Leave No Trace on the Boulder Face: Service Learning Project Design

Essential Question:
What can we do to make a difference about the issue of graffiti on the boulders on South Mountain Trail and Bake Oven Knob?

Lesson Objectives:

Students will plan and prepare to spread the word, prevent graffiti, remove graffiti, and learn more about graffiti in teams.

Students will outline steps they will take to achieve their goals.

Students will work together to create a calendar for their team projects.

Learning Activities:

Break into teams to complete plans and outline steps on a small 2-week calendars. (Ms. Alison meets with each group.)

Gather together as a whole group to fill in the whole-class project calendar.

Begin work on projects.

Project work can take 1-3 weeks and calendars may need to be revised depending on progress, discoveries, and needs.

Samples of team planning forms on following pages.
Goal: Stop people from vandalizing boulders on South Mountain.

Our team’s task: **Spread the word** that graffiti is bad.

**Team Members**
- Mason A.
- Austin
- Chanielys
- Logan
- Isaac
- Jenna

- Brainstorm ways we can spread the word. Record ideas on a piece of drawing paper.
- Discuss **who** we need to spread the word to. Record this information here:

- Work together to choose 2 or 3 ways to spread the word from the ideas brainstorm.
- Talk about each idea.
  - What would you need to know before you could make it happen?
  - What would each of you need to do to make it happen?
  - What resources would you need?
- Based on your discussion, decide which idea is most likely to be successful.
- Write your decision here:

- Plan the steps for how you will accomplish your task.
Goal: Stop people from vandalizing boulders on South Mountain.

Our team’s task: Find a way to prevent graffiti.

Team Members
Ian
Rebekah
Maya
Meliha
Brooke
Clara

☐ Brainstorm ways we can prevent graffiti. Record ideas on a piece of drawing paper.
☐ Discuss what happens before people choose to vandalize.

☐ Work together to choose 2 or 3 ways to prevent graffiti from the ideas brainstorm.
☐ Talk about each idea.
  o What would you need to know before you could make it happen?
  o What would each of you need to do to make it happen?
  o What resources would you need?
☐ Based on your discussion, decide which idea is most likely to be successful.
☐ Write your decision here:

☐ Plan the steps for how you will accomplish your task.
Goal: Stop people from vandalizing boulders on South Mountain.

Our team’s task: Find a way to **remove** graffiti or **restore** the boulders.

**Team Members**
- Mason W.
- Celestina
- Aiden
- Johanna
- Dylan
- Kelcy

- Brainstorm ways we can remove graffiti or restore the vandalized boulders. Record ideas on a piece of drawing paper.
- Discuss environmental concerns about your ideas. How will you protect nature?

- Work together to choose 2 or 3 ways to remove graffiti/restore the boulders from the ideas brainstorm.
- Talk about each idea.
  - What would you need to know before you could make it happen?
  - What would each of you need to do to make it happen?
  - What resources would you need?
- Based on your discussion, decide which idea is most likely to be successful.
- Plan the steps for how you will accomplish your task.
Goal: Stop people from vandalizing boulders on South Mountain.

Our team’s task: **Learn more** about graffiti and the people who do it.

**Team Members**
- Cameron
- John
- Deana
- Julia

☐ Brainstorm ways we can learn more about graffiti and the people who do it. What do you want to learn more about? Record ideas on a piece of drawing paper.

☐ Discuss how you can find out more. Who could you ask? Where could you research?

☐ Work together to choose 2 or 3 ways to learn more about graffiti from the ideas brainstorm.

☐ Talk about each idea.
  - What questions would you like to answer?
  - What would each of you need to do to find the answers?
  - What resources would you need? What kinds of people could help you?

☐ Based on your discussion, decide which idea is most likely to be successful.

☐ Write your decision here:

☐ Plan the steps for how you will accomplish your task.
Leave No Trace on the Boulder Face Service Learning Project Summary

We identified a need to address the detrimental human-natural system interaction of graffiti vandalism on the boulders on the South Mountain trail. Student teams developed a project that included four goals:

1. "Spread the word that graffiti is bad." (Educate the public.)
2. "Find a way to prevent graffiti."
3. Find a way to remove graffiti or restore the boulders.
4. Learn more about graffiti and the people who do it.

Group 1 planned and undertook a campaign to create t-shirts with an anti-graffiti message. When they discovered that boys ages 12-19 were the most frequent graffiti vandals, they decided that girls in that age group should wear the t-shirts because boys are influenced greatly by what girls think is cool at that age. They confirmed this assumption by informally interviewing several groups of boys and girls in this age group. In addition, this group sought other kinds of paint for self-expression and found that Crayola Sidewalk Paint might fill the need to express feelings and memories temporarily as it washes away and does not harm the environment.

Group 2 created a skit about graffiti and how it impacts humans and animals and shared the skit with all of our middle school students. In addition they talked with them about their opinions and experiences with graffiti. This group learned as much as they taught as they found some surprising opinions shared by the middle school students. This group also revised their skit for a presentation to the entire K-5 student body.

Group 3 identified several methods for graffiti removal including using chisels and wire brushes to scrape away the paint and spray painting natural colors over the graffiti. They arranged for Tom Gettings to come teach us about the way the Wildlands Conservancy currently addresses graffiti on the boulders (creatively spray painting over the graffiti so it looks like a boulder again). We also discovered the possibility of power washing if we could find an access road within 400 feet. And we found a biodegradable graffiti removal product to test.

Group 4 researched graffiti to answer questions brainstormed by the class. They also created a survey for our middle school students and local middle and high school students. They will analyzed the data for a report they plan to share with the community.

Testing methods is a two-week process that includes assessing:

- how the method impacts the environment
- cost
- difficulty
- effectiveness

Students will do an initial information-gathering hike to determine whether the power washer can be used (seeking a potential access road) and testing chisels and wire brushes on graffiti on a small boulder. A follow-up hike will comparison test the graffiti removal product and spray painting. The final hike will be a graffiti-removal time using the most effective method. This will also be shared with the local Appalachian Trail club to get permission to remove graffiti on the boulders on Bake Oven Knob in January when we return to the Appalachian Trail.

Community need the project(s) addressed:

Issue of unwanted graffiti on the boulders on South Mountain Trail

Student involvement in designing the project(s):

Students brainstormed issues and problems after creating systems circles at the start of the unit and we revisited our lists throughout the unit. Over the course of the unit, students
became aware of the problem of graffiti on the trail and started to naturally brainstorm solutions. Students developed the goals, did the prep work, fundraising and ingathering of supplies, map-reading, testing, presenting, and reporting.

Academic objectives of the project(s):
- To give purpose to student learning.
- To use literacy skills to read about unit topics (for a purpose)
- To use literacy skills to write about unit topics (for a purpose)
- To build teaming skills
- To use math, organization, and construction skills
- To put systems knowledge into action
- To make a difference in the world

Duration of the project(s):

Brainstorming took place in the first weeks of the unit (September -- approx. week 3), finalizing the project took place with one month left in the trimester (November). Testing methods took place in the first two weeks of December. Work stopped as the weather turned too cold to proceed with graffiti removal, but will continue when the weather gets warmer. The Leave No Trace on the Boulder Face project will be completed by Spring 2014 with four final steps:
- comparing the two choice methods (creative disguise vs. biodegradable graffiti removal product)
- restoring boulders on South Mountain (school day hike)
- restoring boulders at Bake Oven Knob (weekend family hike)
- final student reflections
Literacy Connection: Reading, Writing About and Discussing Survival Literature

Learning objective(s):
- Students will read and discuss *Hatchet* by Gary Paulsen.
- Students will refer directly to the book (giving page number and reading aloud) in discussions and journal entries, quoting accurately when drawing inferences.
- Students will spell content-specific and grade-appropriate words correctly in their journals.

Adopted Instructional Materials and Other Resources:
- *Hatchet* by Gary Paulsen (24 student copies)
- Student reading journals
- *Hatchet* study guide
- Online activities, discussion points, and descriptive writing prompts:
  - [http://www.mce.k12tn.net/survival/hatchet/hatchet.htm](http://www.mce.k12tn.net/survival/hatchet/hatchet.htm)

Summary Description:
Students will learn how we do literature study in a whole class literature circle. We will read *Hatchet* by Gary Paulsen and enjoy daily discussions and learning activities for each chapter. Students will also apply systems thinking to this book and diagram the natural system in which Brian finds himself as well as the food web he discovers he is a part of. Students will apply systems topics and questions to literature study.

Literacy Connection: Reading About and Discussing Graffiti

Learning objective(s):
- Students will read and discuss *Graffiti in Tahiti* by Victoria Wilson-Merritt (Anomic Solutions).
- Students will refer directly to the book (giving page number and reading aloud) in discussions and journal entries, quoting accurately when drawing inferences.
- Students will spell content-specific and grade-appropriate words correctly in their journals.

Adopted Instructional Materials and Other Resources:
- *Hatchet* by Gary Paulsen (1 copy for read aloud, multiple copies for small groups or 24 student copies)
- Student reading journals
- Literary Graffiti (interactive website)

Summary Description:
Students will experience *Graffiti in Tahiti* either as a read-aloud, small group literature experience, or shared reading experience with a younger school mate (ex. first grade reading buddies). After reading students will discuss what stood out for them. Questions to inspire discussion include:
- What was not realistic about this story?
- What was realistic about this story? What is true about graffiti in the human world that is true in this story?
- How did graffiti affect the reef? How is that similar to how graffiti affects neighborhoods? How is that similar to how graffiti affects trails?
- Why did “Chomp” want to create graffiti? What were the consequences of his actions? How else could someone gain fame that would not hurt anyone else?

After reading and discussing the picture book, invite children to write a head-heart-hands reflection in their reading journals. Use this response as inspiration for persuasive writing pieces or student-created picture books about the impact of graffiti vandalism.
Math Connection: Converting Mileage

Learning objective(s):

- Students will use map keys and scales to determine the length of the Appalachian Trail and the length of the orange trail on South Mountain.
- Students will experiment with different ratios to convert miles on our trail to miles on the AT so we can do a virtual through hike from Maine to Georgia using our local hikes to mark our progress on the large AT map.

Adopted Instructional Materials and Other Resources:

- Large AT map
- Trail map from South Mountain

Summary Description:

Students work together with the teacher to estimate the length of the AT and the length of the orange trail on South Mountain. The actual distances are then provided for students to use to determine how many miles our hikes are “worth” on the AT so that we will virtually hike the AT between October and June using our real hiking mileage equivalencies to mark our progress on the large map.
Trail to Trail: Leave No Trace on the Boulder Face

Alison Saeger Panik
Seven Generations Charter School
Implementing Trail to Every Classroom
Applying systems thinking to address the issue of vandalism on natural boulder sites
On South Mountain Trail near Emmaus, PA
and on the Appalachian Trail at Bake Oven Knob
Comparing Two Trails

**South Mountain Trail**
- Managed by the local Wildlands Conservancy
- Pennsylvania Highlands
- Located on the southern edge of the Lehigh Valley
- 5 miles of trails/loops
- Billion year old boulder field

**Appalachian Trail**
- Managed by local AT Trail Clubs (Allentown Hiking Club and Blue Mountain Eagle Climbing Club)
- Appalachian Mountains
- Located on the northern edge of the Lehigh Valley
- 2180 miles of trails, north to south
- Boulder-strewn knob overlook
September 2013: Survive & Thrive

What is a habitat? What are the five elements of survival? How are human needs different from the needs of other living things? What is Maslow’s Hierarchy of Needs? What is the difference between surviving and thriving?
Habitat Dioramas

Demonstrate understanding of habitat and the five elements of survival necessary for a native animal or insect to survive and thrive
Systems Circles

Visual representation of social and natural systems of which we are a part
October 2013

How do natural systems impact human systems? How do human systems impact natural systems? What are the Principles of Leave No Trace? Why are they important? How do we uphold them at Seven Gen?
Presenting Leave No Trace at All-School Morning Meeting

Viewing Leave No Trace through the lens of an earthworm
Dedication of Seven Gen Wildlife Sanctuary
Meet the Appalachian Trail

Calculating mileage equivalents
Investigating maps
Marking our “hikes” on the big map!
Leave No Trace Investigation on South Mountain

Discovering graffiti – setting up the problem we need to solve
Leave No Trace Posters
Displayed on banner in our hallway across from the Appalachian Trail progress map
South Mountain Trail Hike

Comparison hike investigating geography, terrain, climb, views, wildlife, boulder site, and plant life on our local trail on Monday in preparation for comparing with the Appalachian Trail on Friday.
Appalachian Trail Hike

Investigating and discussing the graffiti on Bake Oven Knob
Comparing the AT with South Mountain Trail
Systems Posters

Demonstrating understanding of systems in preparation for our investigation into the issue of graffiti on the trail – Subsystems, components, process, functions, interactions, issues/concerns
What causes vandalism? How are unmet needs a cause of vandalism? What human needs are “met” through vandalism? What tools/technology were used to create the graffiti? What is the content of the graffiti? What kinds of categories could we create to understand the types and purposes of graffiti? Where is the graffiti located? What makes these locations more graffiti prone than others?
Students recorded observations of the graffiti on South Mountain (outdoor research).

Students researched answers to the questions posed by classmates using the Internet and data published in the Graffiti Hurts curriculum.

Students also surveyed local middle school and high school students.
Preventing Graffiti

Students presented a question-and-answer introduction to graffiti, acted out a skit, and led a discussion with middle school students about their experiences with and opinions of graffiti vandalism.
Getting the Word Out

Creating anti-graffiti t-shirts! Each student made one for himself or herself and one for a teenager to wear to spread our message for us.
December 2013

How can we restore the boulders? What methods will we try? How will we evaluate the methods? What information do we need before we test the methods? What resources (human and material) do we need to make this happen?
Students raised $118 to put toward materials needed to restore the boulders. $60 went toward The World’s Best Graffiti Remover and the rest went to spray paint, masks, gloves, and wire brushes.

Cookie Sale Fundraiser

Students created method tables in their investigation notebooks to record the results of our tests.

Methods Table

Students created method tables in their investigation notebooks to record the results of our tests.

Learning the Spray Paint Method

Tom Gettings, Wildlands Conservancy, shared their problem-solving process and results and taught children how to creatively spray paint over the graffiti to restore the boulders.
Testing Out The Methods

Creative Disguise (spraying over graffiti) – successful
Wire Brushes – successful on a wet day (rags & buckets of water needed)
Chisel and Hammer – not successful and damaging
Power Washer – measuring distance to nearest access road – too far
Restoring the Boulders on South Mountain
Restoring the Boulders on the Appalachian Trail