

Big Idea

What is the main idea you want your students to come away from the unit knowing?

Learning how scientists use transects as a sampling method for organisms over a large area like the Appalachian Trail and then applying a transect to the Appalachian Trail. Also looking at all the different organisms and how they coexist in the same environment. Finally, how to share what they learn with elementary students and how they can apply it to their own trail at the elementary school.

PROJECT BY: Jo-el Nelson and Betty Gatewood from
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A Trail to Every Classroom
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Student Assessment

How will you assess student learning? How will you know if they have met the goals for the established outcomes?

Students determined what they wanted to include in their projects and I wrote their ideas on the board as they came up with the ideas. I then took the ideas and put them into a rubric with assigned points before they started on the projects. The projects were done in groups, but the research papers and 3-D models were done individually. They were tested with a short answer and discussion test on the information about the National Parks, Wildernesses, National Forests, and the Appalachian Trail.

I assist them in their learning by directing them, giving them information, leading their discussions, and giving them time to work with myself and experts available to help them.

Reflection

How will reflection be built in to your curriculum and activity(ies)?

This project took 10 weeks to complete. Students were introduced to the idea of transects early in the year. They learned about the Appalachian Trail, National Parks, Wildernesses, and National Forests. Then they transected the elementary school trail. They did all that build-up before going to the AT and hiking on the trail. We also had a hiker come and talk before we got on the trail and I read to them from a Walk in the Woods by Bill Bryson. There was plenty of time for reflection between each of these activities so I hoped that the actual transect would be a form of reflection on every thing they had learned so far. On the trail, I led the students at the front and Betty brought the students at the back. Students were on their own to film and look for their organisms with Betty and myself there as support when they needed help finding or identifying organisms.

Reflection is always built into each activity along the way as a writing reflection after an activity, a drawing activity, or as a whole group or small group discussions to reflect on what they have learned or gotten from an activity.

Models

How will students understand where they're supposed to get? What exemplars of student work will they see? What opportunities will there be for them to critique each other's work?

Last year, my students made movies on movie maker about environmental science issues. Those projects were shown as examples of how to use movie maker. A transect was taught in the classroom using string and pencils. Students were given the flip cameras to practice with on the elementary school trail looking for their chosen organisms. They returned to class and watched their videos to see how the cameras worked.

When everyone finished their movies, we watched them in class and laughed, clapped, and enjoyed the movies. This was our individual class celebration.

Resources

Describe resources (books, articles, materials, supplies) you will use to support this unit?

**The Appalachian Trail MEGA-Transect booklet by AT conservancy, NPS, and USGS
Place-Based Curriculum by David Sobol**

**Last Child in the Woods: Saving Our Children from Nature Deficit Disorder by
Richard Louv**

A Walk in the Woods by Bill Bryson

Leave No Trace booklet by Bureau of Land Management and US Forest Service

Partnership(s) & Benefit(s)

Who are potential community partners who could assist you and your students?
What are the potential benefits for you, your students and the partner(s) by working together?

For the projects, my classes worked with the Potomac Appalachian Trail Club, Sandy Greene at the Soil and Water Conservation, Nancy Sorrells, our Riverheads district supervisor, Betty Gatewood at Mary Baldwin College as my partner on the transect and a liaison for the trail clean up. My class is also working with the elementary school in 4th and 2nd grade to teach younger students about the AT.

All of these partners were fabulous and supportive. They helped with resources with money, information, and tools. This project has shown me how my community is essential to my students getting the best classroom experience possible.

Youth Voice

How will you guide your students to express ideas, be involved in project decisions, and evaluate outcomes?

Students were able to choose what organisms they transected along the trail and if they wanted to use flip cameras or still photos to record their transect. Students came up with the idea of celebrating with the 4th graders at the elementary school.

National Honor Society students were given a choice of doing the AT work or a road clean-up and chose the AT trail work.

As always happens with projects, the students found things evolved different than they or I planned from the beginning and they rolled with the changes. They are encouraged to take the project in whatever direction their research or findings carry them with myself as a resource to give them guidance when they need it.

For evaluation, I let them decide what should be included in the project and then typed up a rubric with the requirements and points.

Project

What project(s) could your class undertake that would actively engage your students in learning about this theme? What could the final product be?

Each class is doing a transect of organisms along the Appalachian Trail. At Jarmin Gap we hike up a fire road and then one block goes North and the other goes South. Transected organisms included birds (helped in identification by Betty Gatewood), trees, insects, mushrooms, reptiles, and wildflowers. Chestnut trees were included in the transect due to their current status of endangerment due to the wool adelgid.

The National Honor Society helped on a trail clean up day with the Potomac Appalachian Trail Club with Mark and Betty Gatewood.

The high school students made movies of their findings including graphs of the organisms found. The movies were accompanied by papers that researched the organisms they found along the trail. It was a successful project other than the movie maker being unable to handle too many flip camera videos without slowing down or locking up. I am working on another option for the spring semester – maybe using still pictures and then using photo story but that is a work in progress.

The other goal was to make a brochure that highlighted local hikes, including the Appalachian Trail, but that may be a project for next semester due to other projects such as Trout in the Classroom, bacteria sampling of local streams for a presentation to the local ruritan club and helping plan and plant a bioretention area at the local Dollar General.

The final part of the project is the celebration which I will describe in the celebration section.

Another future goal is to get Chestnut trees to plant on the Riverheads High School campus for environmental and genetic studies.

Community Opportunities

What opportunities or needs exist with Appalachian Trail Partners that could be fulfilled by your students? Keep in mind opportunities for interdisciplinary learning.

The elementary school that is on the hill above our school has been looking for ways to use their nature trail in more ways. Fourth grade students can do mini-transects of know species and share with younger students in the school to encourage students and teachers to get on the trail.

Working with the local district supervisor in our county about bioretention and how it relates to invasive and native species when planting a runoff ditch at the local Dollar General.

Working with two representatives from Soil and Water Conservation Office to test water and see how water chemistry affects the local flora and fauna.

Finally, students are hoping to make brochures about the Appalachian Trail and other local hikes to share with the community a guide to great hiking trails in the area.

Finally, we are hoping to work with the American Chestnut Foundation to get some Chestnut trees to plant on our school campus that can be studied in biology classes to help understand genetic crosses.

Skills & Habits of Mind

What are the academic or life skills students will gain from this unit? What habits of mind do you expect them to demonstrate? Think all disciplines.

Life skills – Identification of species and observation of ecosystems that are similar to ecosystems where they live. They can use their knowledge of invasive and native species to landscape their yards.

Academic Skills – Students will learn to do transects and why transects are used as a scientific tool. Students will learn identification and local invasive species. Students will learn native species and community relationships within an ecosystem. They will also learn how the abiotic and biotic factors both affect the ecosystem.

Essential Questions (Content)

What are the essential questions that will help guide students toward understanding the Big Idea?

Why should we care about the number and type of organisms along the Appalachian Trail?

What are the species indicators for a healthy ecosystem? An unhealthy ecosystem?

After doing the transect, what ecosystem problems do you suspect from the indicator species that are present?

What causes species to be endangered?

State Standards/Outcomes

Which elements of the state framework of standards does this unit address? What are the skills and outcomes you are working towards?

- LS.10 The student will investigate and understand how organisms adapt to biotic and abiotic factors in a biome. Key concepts include
- * differences between ecosystems and biomes;
 - * characteristics of land, marine, and freshwater biomes; and
 - * adaptations that enable organisms to survive within a specific biome.
- LS.11 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term). Key concepts include
- * phototropism, hibernation, and dormancy;
 - * factors that increase or decrease population size; and
 - * eutrophication, climate change, and catastrophic disturbances.
- LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include
- * food production and harvest;
 - * change in habitat size, quality, and structure;
 - * change in species competition;
 - * population disturbances and factors that threaten and enhance species survival; and
 - * environmental issues (water supply, air quality, energy production, and waste management).
- BIO.1 The student will plan and conduct investigations in which
- * observations of living things are recorded in the lab and in the field;
 - * hypotheses are formulated based on observations;
 - * variables are defined and investigations are designed to test hypotheses;
 - * graphing and arithmetic calculations are used as tools in data analysis;
 - * conclusions are formed based on recorded quantitative and qualitative data;
 - * impacts of sources of error inherent in experimental design are identified and discussed;
 - * validity of data is determined;
 - * alternative explanations and models are recognized and analyzed;
 - * appropriate technology is used for gathering and analyzing data and communicating results; and
 - * research is used based on popular and scientific literature.

Your Evaluation of the Unit

How will you evaluate the unit and make note of what worked well and what could be improved? How will you analyze and interpret project outcomes?

I have already evaluated the unit by how well things worked. The transecting itself worked really well. The research on organisms worked well. Problems occurred with the flip cameras not showing good detail for students to identify organisms when they got back and when we tried to put the flip cameras videos into movie maker. The movie maker program had a hard time handling the flip videos and froze up often. It was frustrating for the students and also for me. Next time we will use still photography for identification and make movies with the flip camera without having to put them into another program. In this way, the students will be actually filming a movie and that will make the set up a little different. I am still thinking about how I want to work that part. I have done movies on the flip cameras before, but I don't want to lose the focus on the transect by playing with flip cameras. If you are interested, I can tell you how it turns out next semester. Just let me know.

Final Celebration

How will you celebrate the success of your unit and share its results with the school and community?

One final celebration was when we watched the movies made by the groups on their transects. The movies were very good and students included humor and music into their videos.

The big celebration is going to be when we put all the movies together and show them to the entire 4th grade. The students are looking forward to that and the fourth graders seem to be as well. Betty Gatewood, Nancy Sorrells, and Sandy Greene will be invited from the community.

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