



GREAT SMOKY MOUNTAINS
INSTITUTE AT TREMONT



More Than Just a Field Trip...

Connecting Students & Nature

*Independent Evaluative Study Detailing How
Great Smoky Mountains Institute at Tremont
Programs Impact Students' Attitudes
About Nature and Their Surroundings*

Great Smoky Mountains Institute at Tremont...

...is a residential environmental learning center located within the heart of Great Smoky Mountains National Park. We are a private, non-profit organization that works closely with the National Park Service to provide educational programs that increase the awareness, appreciation, and understanding of the natural and cultural resources of the Great Smoky Mountains and promotes stewardship of these resources.

Groups of all ages visit Tremont to live and learn, using the national park as an outdoor classroom. Great Smoky Mountains Institute at Tremont has something for everyone. Whether focusing on the park's rich cultural history or unfathomable biological diversity; participants in Tremont's programs, school trips, adult workshops, family camps, and youth camps

leave with a greater sense of wonder, depth of knowledge, and appreciation of history and natural systems.

Miles of trails and a half million acres of mountains and forests surround Tremont. In addition to these excellent natural resources, Tremont facilities include a dormitory, dining hall, classrooms, outdoor meeting shelters, and a bookstore.

...connecting people and nature

This project was made possible by funding from the ALCOA Foundation and in partnership with the National Park Service.



Our Mission

Great Smoky Mountains Institute provides in-depth experiences through educational programs designed to nurture appreciation of Great Smoky Mountains National Park, celebrate diversity, and foster stewardship.



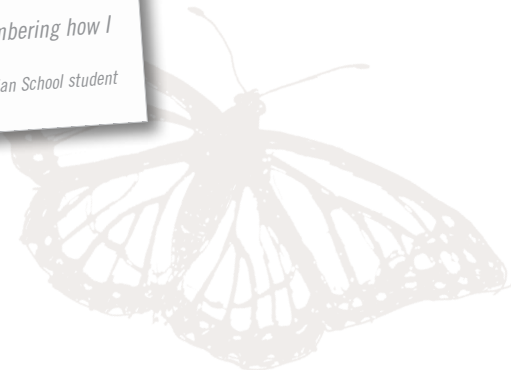
"I feel special here, being a part of life."

—Celia, age 9



I like looking through my dirty clothes and remembering how I got them dirty at Tremont.

—Grace Christian School student



Project Overview

Those involved in environmental education (EE)—both educators working in the field and classroom teachers who involve their students in EE programs—know how valuable a residential EE experience can be. Inquiry based, experiential learning has a dramatic impact on students—not just their knowledge of the environment and environmental issues, but also their attitudes towards and understanding of nature, and their own place in it. These positive benefits, while readily apparent, have historically been hard to quantify.

Our goal in conducting this evaluation project is to measure our residential program’s influence on participants’ environmental awareness, attitudes, and behaviors. This information helps

1,037

number of students that took our survey during the '05/'06 and '06/'07 school years

us improve our own programming, and supports teachers’ and administrators’ involvement in residential or environmental education programs. This evaluation project also allows us to measure the value of a residential EE experience for school program participants, giving us scientific data to support the positive benefits we (and others) have observed for years.

While many previous evaluation studies looked at programs for relatively brief periods of time—weeks or months—Tremont’s evaluation process is long-term and ongoing. In 2005, Tremont staff began conducting the survey with nearly every school group attending a Tremont program. A study of this magnitude—conducted over several school years, with students from all over

the country and from a great diversity of socio-economic backgrounds—gives us an incredibly accurate picture of the effectiveness of our programs. The study is continuing, with surveys administered to students during the '07/'08 school year and beyond.

A random sample of students from each school group was administered a survey immediately upon arrival on campus. The same sample of students took another survey just before departing for home. We refer to these as the pre-trip and post-trip surveys.

Our survey also followed students beyond their trip to Tremont, back to their home classroom. Three months following the trip, students and teachers completed a third survey to examine how

number of school groups whose students participated in the study during the same period

112

their knowledge and attitudes may have changed in the intervening months. We will discuss the results of the pre- and post- trip surveys first, and examine the results of the 3-month post-surveys on page 11.

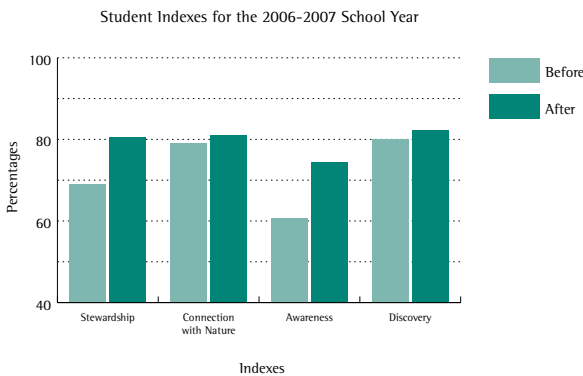
Indexes

Measuring specific outcomes is relatively easy—ask a student the definition to a vocabulary word before and after a lesson, and see what they've learned. Trying to measure values such as "sense of place and connection with nature" is considerably harder.

To address these difficulties, Tremont staff, in conjunction with Great Smoky Mountains National Park (GSMNP) representatives and a professional evaluation team, developed a system of "indexes." Each index consists of a series of related questions, each designed to reveal a student's changing attitudes towards certain concepts and ideas—concepts that can't be addressed in a single, simple question.

Our indexes were developed to reflect and measure the core values of our mission statement, as well as to measure other important impacts of our program, such as interest in learning and discovery. The four measured indexes are:

- Connection with Nature
- Environmental Stewardship
- Interest in Learning and Discovery
- Knowledge and Awareness of GSMNP and Biological Diversity



As shown above, our impacts were clear. Every index we measured showed statistically significant gains* between the pre- and post-Tremont trip surveys. In the following pages, we'll discuss the findings of each index separately.

RESULTS SHOW...

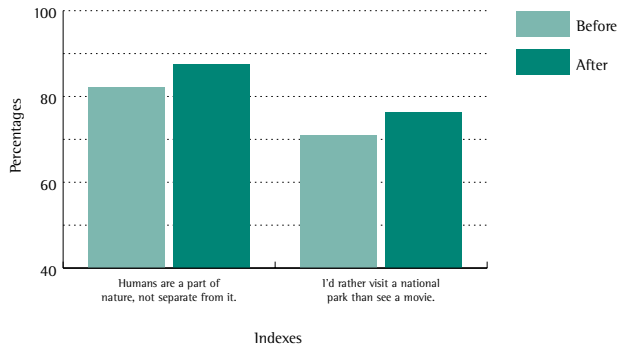
- A significant increase in all of our measured indexes.
- Students leave Tremont with an enhanced understanding of GSMNP, a heightened interest in learning, a deeper feeling of connection with nature, and a greater willingness to act as good stewards of the environment.

**All findings in this document are found to be statistically significant, defined at the standard level of $p < 0.05$.*

Connection with Nature

Students leave Tremont feeling that GSMNP is their second home—a welcoming, comforting, and familiar environment.

Connection with Nature for the 2006–2007 School Year



RESULTS SHOW...

■ Students left Tremont with a better understanding of our place in nature, and a greater interest in participating in outdoor (rather than indoor) activities.

■ Students felt more comfortable in the outdoors after the trip.

■ More students left the Smokies saying they would rather visit a national park than play video games.



Since I came home from Tremont I have gone outside every day, and I used to stay inside. Thank you.
—Courtney, McFadden School of Excellence, TN

This index is designed to measure the student's desire to return to the Smokies and their developing love of nature. It also measures the students' curiosity about the park, biodiversity, and the environment.

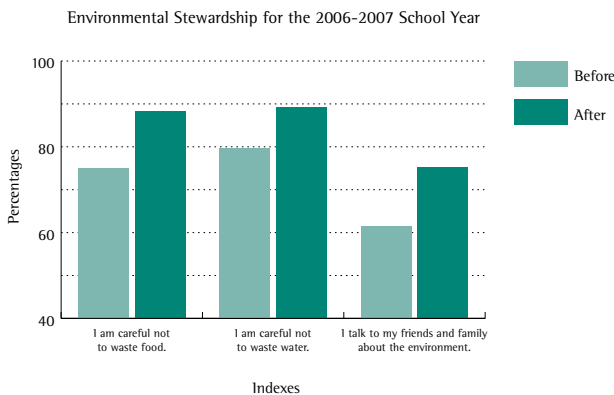
Environmental Stewardship

Students' attitudes and behaviors will reflect an understanding of human impacts on the environment.

This index is designed to evaluate how students' behaviors and attitudes have become more environmentally conscious. Tremont's lessons and practices are designed to model environmentally responsible behavior and decisions that can be incorporated into a student's daily life back home.



Your camp changed my daughter permanently. Thanks for an excellent program. Not only did she talk non-stop about Tremont, but she changed her way of life to be more environmentally conscious.
—Beth Sutton, parent of school program participant



RESULTS SHOW...

- Students showed an overall improvement in their attitudes towards conservation, and their willingness to exhibit environmentally friendly behavior.
- More students said they would like to someday volunteer in a national park, and would try harder to conserve natural resources (food, water, and electricity).
- Students' attitudes towards conservation remained very strong three months later.

RESULTS SHOW...

■ Students' knowledge of GSMNP increased significantly.

■ Students learned specifics about the park and its issues (more students were able to define an "exotic" species), as well as broader concepts of the benefits of national parks (recognizing that parks help protect plants and animals and keep the air clean).

■ Students retained their new knowledge three months later.

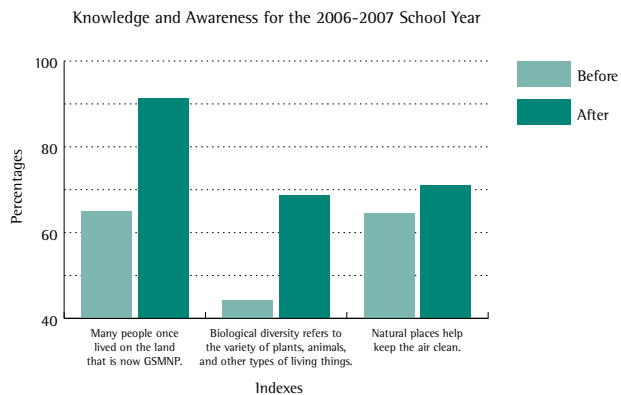
Knowledge and Awareness of GSMNP and Biodiversity

Students will develop an appreciation for and knowledge of GSMNP and natural, wild places.



You learn so much by actually being there, experiencing first hand what you've only read about in books.
—Gabe Herrera, Oak Park River Forest High School Senior, IL

This index is designed to measure students' understanding of the importance of biologically diverse ecosystems. Also measured is the student's understanding of the cultural and natural history of the Southern Appalachians, and the importance of parks' roles as protectors of species, culture, and our natural resources.



Interest in Learning and Discovery

Students will develop an interest and passion for learning.

This index is designed to explore the impact of outdoor experiences on students' interest in learning more about nature, exploring the outdoors, and visiting natural areas. It also explores students' interest in learning more about diversity in people—learning more about different cultures and ways of life.

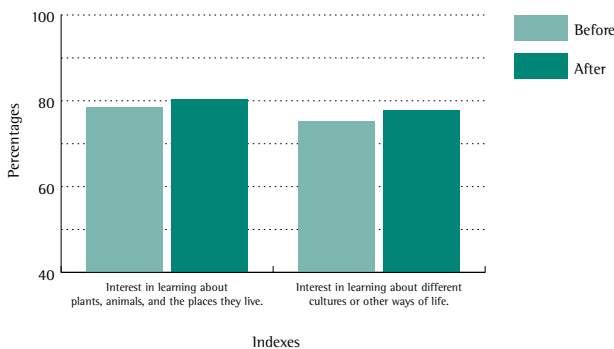


I wish every teacher could see their students in learning situations as unique as Tremont. The labels of "troublemaker," "unmotivated," and "underachiever" melt away in your outdoor classroom.
—Peggy Steffan, Immaculate Conception High School, Memphis, TN

RESULTS SHOW...

- Students showed a greater interest in learning about a wide variety of topics.
- Students left Tremont wanting to know more about plants, animals, and the places they live.
- Students wanted to learn more about cultural history, both about different cultures and ways of life, and the history of their hometowns.

Interest in Learning and Discovery for the 2006–2007 School Year



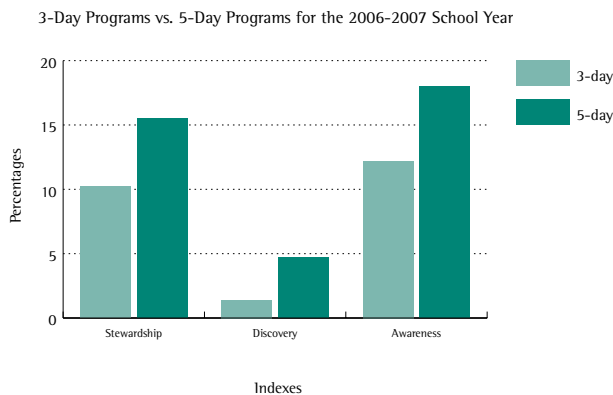
3-Day Programs vs. 5-Day Programs

While exploring our data, we noticed interesting trends emerged when comparing the data from our 3-day and 5-day school programs. 70% of the students who attend Tremont programs come for a 3-day experience.

Students participating in 5-day programs showed significantly higher gains in environmental stewardship, interest in discovery, and awareness when compared with those students who attended a 3-day program.

Those students who participate in a 5-day program have increased exposure to the natural wonders of GSMNP. Through All-Day Hikes, trips outside our valley to various park ecosystems—from high country trips to excursions in Cades Cove, and participation in a greater number of research projects being conducted throughout the park.

While the positive impact of a 3-day program is undeniable, the increases seen in the indexes for the students that participate in the 5-day program are significantly greater, underlining the potential importance of longer experiences in the park.



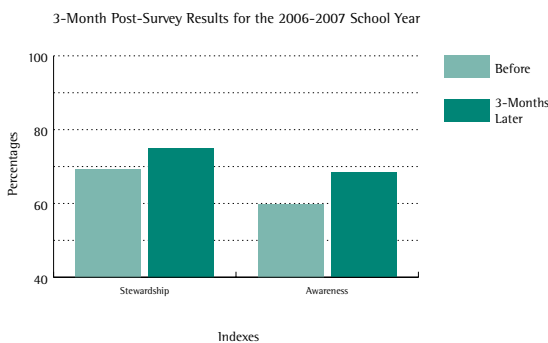
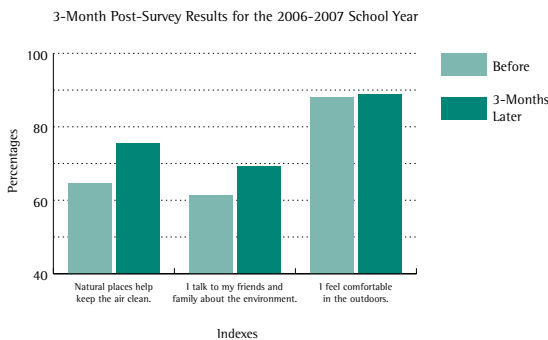
And three months later...

One of the most significant features of our evaluation process is the three-month survey. This allows us to follow up with the students after several months away from Tremont, to measure changes in their attitudes and perceptions.

The results are very exciting! Previous studies evaluating the effectiveness of EE programs show inconclusive results regarding retention of attitudes and knowledge after a period of time. However, Tremont's study

shows that many of our indexes and individual questions remain significantly higher.

Three-month follow-up surveys reveal that increases in students' commitment to environmental stewardship, as well as knowledge and awareness of GSMNP and biological diversity remain significantly higher. Students continue to express significantly increased levels of comfort in the outdoors, as well as a higher level of attention to plants and animals in the surrounding environment.



RESULTS SHOW...

■ Three months later, students retained knowledge of the diversity of plants and animals in GSMNP and the cultural history of the area.

■ Students continued to show increases in their willingness to conserve resources (not wasting food, water, or electricity).

Major findings...

- A Tremont experience strengthens students' connection with the natural world.
- Learning about the outdoors and gaining a better appreciation of its value produces students who are good stewards of the environment.
- Students leave Tremont with a better understanding of science and the natural world—both of specific topics and broader overall relationships.
- Educational experiences outside the classroom heighten students' interest in learning and desire to explore the outdoors.

What does all of this mean?

Environmental educators have a wonderful sense of intuition about how to design and deliver programs that produce desired impacts and outcomes with program participants. With the natural world as our workshop we tap into curiosity, deliver heartfelt messages, and create long-lasting experiences. However, as much as we believe that our work creates lasting, life-changing effects, we haven't been able to prove it until now.

This study demonstrates with real and impressive statistics that we DO make a difference. This study has shown that we CAN measure the qualities our missions espouse. Sense of place, understanding of diversity, appreciation of a national park, enhanced interest in learning, and stewardship in practice are some of those heady attitudes and constructs that we hope to build. This study has shown that we ARE accomplishing these things. It gives us proof that the work we do everyday is well worth the effort.

This study is a tool that assists us as we

improve and adapt our teaching methods to the learning styles of today's students., It challenges us to create programs that best accomplish our mission. It has also taught us the value of staff-driven evaluation developed by our team in partnership with outside experts. The culture of evaluation this created will guide our future evaluation goals and see us through new challenges. This knowledge and the results of our initial evaluation program are also benefiting environmental education programs across our country as they develop their programs and goals.

What comes next?

Happily, as in any good inquiry-based program our attempts to answer questions only generate more. The rich data that we have collected thus far will be mined for answer to new questions in our effort to continue to improve our school program. We are also beginning to develop evaluations for other programs starting with an evaluation of Citizen Science impacts.

Lastly, we are working to develop best practices for a maintenance level evaluation program that will continue our efforts while allowing us to pursue other lines of inquiry. We look forward to sharing those results as they develop.



Tremont does so much for everyone—but most importantly our kids' image of themselves is changed forever.
—Keith Buff, Assistant Principal, Valley Springs Middle School, NC



All the activities we did really helped me have a greater respect for the natural world. I'm convinced that we need to protect what we have and that by doing so we will not only help the environment, but ourselves as well.

—Casey Hinkle, Student

Looking to learn more?

The studies and articles below offer further information on the importance of outdoor experiences:

Cobb, E. (1977). *The Ecology of Imagination in Childhood*, New York, Columbia University Press.

Crain, William (2001). How Nature Helps Children Develop. *Montessori Life*, Summer 2001.

Louv, Richard (1991). *Childhood's Future*, New York, Doubleday.

Moore, Robin C. (1986). The Power of Nature Orientation of Girls and Boys Toward Biotic and Abiotic Play Settings On A Reconstructed School Yard. *Children's Environment Quarterly*, 3 (3).

Pyle, Robert (2002). *Eden in a Vacant Lot: Special Places, Species and Kids in Community of Life*. In: *Children and Nature: Psychological, Sociocultural and Evolutionary Investigations*. Kahn, P.H. and Kellert, S.R. (eds) Cambridge: MIT Press.

Taylor, A.F., Kuo, F.E. & Sullivan, W.C. (2001). Coping with ADD: The surprising connection to green play settings. *Environment & Behavior*, 33(1), 54-77.

Wells, Nancy M. (2000). At Home with Nature, Effects of "Greenness" on Children's Cognitive Functioning, *Environment and Behavior*, 32(6), 775-795.



I really don't know when I've seen students learn with more enthusiasm. I don't think they will ever be the same after an experience like this.

—Kim Howard, Teacher

Special thanks...

This project was an immense undertaking, which simply could not have happened without the support of many people.

We'd like to thank the following people: Marc Stern, Robert Powell, and Nicole Ardoin, who designed the evaluation system, and whose paper, based on data collected during this study, is currently under review by the *Journal of Environmental Education*. They've also published a paper on the evaluation development process, "A Sustainable Evaluation Framework and Its Application" in the December 2006 edition of *Applied Environmental Education & Communication*.

Special thanks also goes to all of the teachers and students who took the time to participate in the study.



You taught us everything we need to know and so much more... and you taught me how to have fun and I thank you for that.

—Angela, Blount County student

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Photos: Josh Davis (front cover, 3, 7, 13, 14, back cover), Trevor Griffith (3), Les McGlassen (6, 10), Bridgette Boudreaux (8), Kent Jones (9, back cover), Jen Martin (13), J Spencer (15).

Tremont does not discriminate by race, color, or creed.



I think Tremont is the best place ever.

—Austin, 5th grader



I bet that every kid that goes to Tremont will change. The reason I know that is because I changed.

—Sean Verklas, 5th grader



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