

As We Are Taught

by Rob Hanson

In the autumn of 2000, after ten years teaching sixth grade in Pomfret, Vermont, I knew I could do better. I took to heart the adage, *"It's not so important what the teacher does, what is important is what the student does."* Still, while my teaching incorporated a host of "hands-on" units, the amount of time children were engaged in truly authentic learning was sporadic. I was ripe for change when a flyer came my way advertising A Forest For Every Classroom (FFEC) - a teacher development course sponsored by Shelburne Farms, Marsh-Billings-Rockefeller National Park, the National Wildlife Foundation, and the National Forest. Most of us can point to some chance meeting that changes us. This was such an event for me. I knew it was time to relearn, and teach, the values of wind, water, soil, and sun. I hoped this course might move me to really do so.

Still, I had my doubts. During my many years of teaching both in California and Vermont I found professional development a mixed bag, at times translating into better teaching but, just as often, mimicking a sterile classroom. Every-so-often, however, a workshop, in service, or college class makes a profound difference in the lives of me and, by extension, my students. In short, there are times when professional development does exactly what's it's meant to do. FFEC turned out to be just such an experience. How so? For me, two Forest For Every Classroom values translate into rich learning experiences for students.

First, empower teachers. I know, I know, "empowerment" is the mother of all catch phrases. Yet it's none-the-less true: to transform the student, first transform the teacher. Really. As with any good teacher, FFEC does it by creating the proverbial rich learning environment. They start with the human environment by bringing a host of local experts from various walks of life in direct contact with teachers in the form of day-long workshops exploring professional practice - be it herpetology, entomology, forestry, geology, animal tracking, logging, forest ecology, or the practice of teaching itself. What makes these contacts uncommon is the vital attribute of the presenters: invariably they possessed not only a deep knowledge of their field, but the ability to effuse their passion in others. In short, they care deeply not simply about what they teach, but about how they teach. In Vermont, it is the likes of Tom Wessels helping teachers "read" the forested landscape and Walter Poleman laying bare how science connects the "pieces, patterns, and processes" of nature. It's the experience of turning over stones in a streambed with herpetologist Jim Andrews in search of salamanders or puzzling out the stories told by animal tracks with National Park Ranger Ed Sharon.

But exposing teachers to superb teachers is not enough. If the model started and ended here, teachers and students may learn something of forests, salamanders, and tracks, but probably little more. It's the second FFEC value, trust, that moves teaching beyond the all-to-common cookie cutter model of professional development. Trust the teacher. Trust the student. Do more than pay lip service to the value the diversity in teachers as learners and, by extension, in students as learners. Trust manifests itself in the FFEC model by giving teachers and students not only the physical resources to create engaging learning, but giving them the most crucial of all resources: time. Time to reflect with colleagues on what best practice in teaching means in their classroom, in their school, in their community. Most important of all, time to craft engaging units. Time to put best

practice directly into the classroom. In this model, teachers and students create learning that is authentic and relevant to their particular lives.

Power Spots and Speak Choruses

I search through my heart for that piece of writing that I know is there. I travel through chambers. In one I see my favorite place, the climbing tree. I am sitting on a tree with my feet dangling over the water. I open my eyes, my true eyes. It's time to leave the past and answer to the present where life presents itself. I sit between two branches with wind on my chest and my feet. I wear only shorts and a shirt, even though there's snow under me. I mingle with the present and the past, as big as life and death.

– Andrew Kimbell, 2005, Pomfret Sixth Grade Speak Chorus

A silent place, far away calls to me, as I sit here drowned in thoughts about the world around me. The only sounds: the river rushing to a unknown destination, the rain hitting the tin roof above my head and running down, the beautiful silence of the forest beings. They sing a song to me. Its melody is familiar; I've heard it before, but I don't what it is. Should I answer back? - Emma McLiverty, 2009 Pomfret Sixth Grade Speak Chorus



So what does the creation of this learning look like? After a year of workshops with superb teachers in diverse fields, I was given another year - a second year! - to develop and implement just one unit that reflected best teaching practice for my classroom. That first unit – Forest Forays – provided my students with outdoor experiences centered around two components, “power spots” and “speak chorus”. (For background on these literary forms, see Giving Place a Voice at http://communityworksinstitute.org/exemplars/reflectretreats/reflectretreat_text/gvgplcvoice.html) Over the course of several days during the school year students kept a journal at spots they selected along a small brook behind The Pomfret School in the Green Mountains of central Vermont. Using their writing, a *What Nature Teaches Me* speak chorus script emerged that was rehearsed for a series of performances in the broader

community. It's an ancient notion that, on some level, children have a stronger connection to the natural world than adults, especially in civilized societies. The series of speak chorus performances contained not only lessons children learned from non-human nature, but, also, lessons we learn from children. In effect, my students became young teachers giving place a voice, passing nature's wisdom to us, and, in the processes, acquiring an abiding confidence in their ability to communicate through the written and spoken word.

This sapling in front of me teaches me to have patience. In one day you don't learn everything you want to or go where ever you want to. All those things take a long time and a lot of patience. Neither you or the sapling grow fully over night; it takes a very, very long time to grow. I also learned that if you want to be very skilled you must have patience like a tree growing larger than all the others. Griffin Thomas – 2009 Pomfret Sixth Grade Speak Chorus

The writing that emerged from Power Spot journaling, and its use in a Speak Chorus, was consistently profound. Students began to view themselves as both writers and thinkers with an important message to share. While creating a safe emotional environment for writers was key to the production of quality work, I am convinced that the students' multiple field experiences played an equally important role. Fostering engaged, caring students doesn't mean tossing out rigorous academics, it means providing such skills and concepts through experiences that offer meaning, context, and passion. Experience provides the grist for powerful writing, authentic science, meaningful mathematics, living history. We must not only have something to learn, but something to care about learning. This does not mean that direct instruction is in any way ignored or even given a back seat, but simply acknowledges such instruction rarely succeeds in isolation of authentic experience.

A large ancient maple tree sits on the bank across from me. It has lived through many hardships: violent storms, floods tugging at its roots, and humans looking to cut it down. But it made it through these hard times and is now standing tall, lording over the rest of the forest. It teaches me to be strong, to live through the hardships in life, to keep my head high even when things aren't going well. Trees take light when they can for if they don't grow fast enough others overshadow them and take their light. The lesson: Don't procrastinate, waiting for something better to come along. It may not. Like a healthy tree, reach for the light before it's too late. - Anna Sand and Amy Davis, 2006 Pomfret Sixth Grade Speak Chorus

In the context of classroom time, what does the use of field experiences to enhance the classroom involve? Balance. Although I am seen as promoting outdoor education I doubt my students spend more than 10% of their school hours learning outside. Given students spend nearly all their school days inside in highly structured, social environments, balance dictates at least a small portion of time should allow time outside and alone. We talk of providing learning with reflection time but rarely give students the time or place to reflect. Seen in this light, field days are not an extra or tangential to classroom learning, but an integral part of the curriculum. The 90% of time spent in the classroom consists of mix of project-based and more traditional units incorporating direct instruction of academic skills. This balance of project-based, constructivist teaching with the best of traditional elements is the norm throughout our school and, increasingly, in many classrooms throughout Vermont and the nation.

“Yet knowing how way leads on to way, I doubted if I should ever come back.”

– From The Road Not Taken by Robert Frost

Pomfret’s sixth grade class debuted its first full-fledged speak chorus to Forest For Every Classroom teachers at the Marsh-Billings-Rockefeller National Historical Park in the autumn of 2002. It was a hit and, for the following four years, subsequent Pomfret classes composed, rehearsed, and performed choruses for audiences around New England. We gained a reputation as “that nature speak chorus class”. But, as time passed, I began collaborating with other teachers and organizations to create a variety of venues for outdoor learning: Mountains and Rivers Forever, National Park Research, Appalachian Trail hikes, the Horizons Observatory, and A Cosmic Sense of Scale.

Mountains and Rivers Forever

Summertime. School’s out. Days are long, nights are warm. Mountains and rivers beckon us outdoors. It’s a time to slow down and unplug. A time to explore the woods, the sky, and ourselves. A time to work, restore, and play upon the land. Mountains and Rivers Forever offers young adults between the ages of twelve and fifteen a time to wood carve, stargaze, trail build, hike, float a river, journal, and farm. – From the Mountains and Rivers Summer Camp Brochure



Local Forester Patrick Barlett sharing Norway Spruce seed adaptations with MRF 2007 campers.



In the fall of 2006 Rick Dustin-Eichler (my close friend and colleague) and I approached the Marsh-Billings-Rockefeller National Historic Park and the Wellborn Foundation with an idea: combine the best elements of an outdoor summer camp experience and best practice in teaching pedagogy. Targeting early adolescents (ages 12-15), an age group we felt is poorly served by outdoor education, our goal was to develop an understanding of land stewardship, sustainable agriculture, and a sense of place while serving the community. Both the Park and Wellborn liked the thinking and committed financial support, human resources, and the use of the entire Park. During the winter and spring of 2007, we worked closely

with the Park's Christina Marts and ranger Marie Hanson to integrate traditional camp activities such as swimming and hiking with activities that taught the values of land stewardship: trail building with the Vermont Conservation Corps, working on a local farm, and learning to carve spoons from a local woodworker.

Watershed: n. 1. a ridge or stretch of high land dividing the areas drained by different rivers or river systems 2. A crucial turning point affecting action, opinion, etc.

Typical of Mountains and Rivers Forever (MRF) two weeks of offerings is the watershed hike. What better way for campers to understand the key concept of a watershed then to actually walk a tributary to the Ottauquechee River, then jump on inner tubes and float the river? This full day activity, detailed below, begins with a FFEC-like use of local field experts, in this case entomologist Alan Graham.

"Look at this! Oh, it's sooooo weird! Alan, come here. What is it? It's really cool." Alan Graham leans over the plastic tray half filled with pond water and teeming with scudding creatures. "Oh, that IS cool," he replies. "Very cool. This particular larva tells us that the Pogue probably has low levels of pollutants. Look at your macro invertebrate chart and

try to identify it.” As the camper huddles over the chart with her teammate, Alan moves to another group of adolescents mining the water for macroinvertebrates.

Chatter punctuates the next hour as stonefly, dragonfly, and caddis fly larva are uncovered. Each discovery is invariably followed by the class clustering around the student making the find and providing Alan with a series of teachable moments about macro-invertebrate adaptation and use as indicator species. As the children observe these seemingly alien creatures, Alan’s explanations and observations matter to them in a way that goes beyond classroom learning. They are not merely studying diagrams of food webs and specialized adaptations, but observe these ideas directly.

So begins the watershed hike for a dozen Mountain and Rivers Forever young adults in the summer of 2009. After their time with Alan at the Pogue, a 14 acre pond in the Marsh-Billings-Rockefeller National Historical Park, they weave their way through an isolated, little known ravine transecting a mixed broadleaf forest and stands of hemlock. It’s certainly a typical walk in the Park since the “trail” is the Pogue Creek itself. Campers spend the next two hours sloggng through water and climbing over a multitude of deadfalls crisscrossing the creek. Although it’s a tough walk by any standard, and several campers endure scrapes, not a complaint is heard. After nearly an hour, they suddenly emerge onto Route 12, a piece of road they have frequently travelled on the way to town or school. Their entire “wilderness” scramble occurred within a mile of a section of road they thought they knew all-too-well.

Here lies the first confluence, the place where the Pogue Creek flows into Barnard Brook. Across Route 12 a Park ranger waits in a dirt parking lot with a dozen river tubes. After lunching on peanut butter with strawberry jelly on bagels and downing a couple cups of lemon-aide, campers inflate their tubes and put into the cool Barnard Brook. The float begins. It’s a lazy endeavor as the brook oxbows through pasture land and wood, then unexpectedly under a familiar bridge or stretch of road. A half hour later the brook merges with the Ottauquechee River itself. Alder-lined oxbows give way to a wide river flowing between cornfields at the base of wooded hills and Vermont’s Route 4. But, close as traffic is to the river, the buffer of riverbank and vegetation muffles the noise. The leisurely float is punctuated with short sections of shallow white water and, with few overhanging trees, sunlight warms both water and camper. Someone shouts, “Look at that bird!” as a kingfisher lifts off an overhanging branch and takes flight downstream. The miniature flotilla eventually pulls out at a sand bar a couple miles downriver where parents await to pick-up. Exhausted campers sit on their deflating tubes all-the-while recounting the details of the watershed hike, from the alien-like dragonfly nymphs to using deadfalls as balance beams across Pogue Brook, to shooting the riffles of the Ottauquechee.

These children now understand Webster’s first definition of “watershed” beyond mere words. Indeed, for a few, it’s the second definition that defines their experience. As teachers, this too is our ultimate destination.



And so goes Mountains and Rivers Forever Summer Camp in the coming days. Campers return the next two days to build water bars with a dozen members of the Vermont Youth Conservation Corps on a trail in the National Park. The following day finds MRF campers joining a team of young adults from the Bronx to muck out a barn on a Vermont dairy farm, followed by a day split between coring white pines in the Park with a forester and inventorying red-backed salamanders in a mixed hardwood forest. The following week they finish their MRF experience by backpacking a dozen miles over two days, using map and compass by day and stargazing beneath Cygnus the Swan, Lyre, and Aquila the Eagle - the great summer triangle - by night. Along the way, campers take stunning nature photographs and built an understanding of how conservation really works on the ground, experiencing sustainable forestry and farming first hand.



*Stone Beneath
Fern,
Photograph by
Rosalie Geiger,
2011 MRF
Camper,
MBRNHP*

But can such summer camp experiences really inform formal education, especially given the extensive learning standards teachers are required to address? The “summer camp experience” is sometimes degraded by educators as mere respite from the real work of academic learning, important but not contributing directly to intellectual growth. Absent are assigned reading, writing, indeed seemingly the entire school curricula. Further, camps are usually staffed by nonprofessionals straight out of high school or college. What can public education learn from camp?

Lots. All-too-frequently traditional classrooms find students sitting hour after hour, day after day passively “learning” skills and concepts. Yet, even with dynamic teachers, student engagement is often minimal. Tough questions must be asked. Are students actively engaged in their learning in a way appropriate for them? As importantly, do they have a reason to care. If so, do they? Is motivation based on mere grades or are the students actively engaged in problem solving, questioning, writing, and mathematics for reasons they know and care about? Certainly, a good teacher facilitates, motivates, and, yes, instructs, but it’s student performance that ultimately counts. While the camp experience does not substitute for formal education, it often offers the context needed for authentic, engaged learning.

Marsh-Billings-Rockefeller National Park Research Projects

After several summers of directing Mountains and Rivers Forever, Rick and I came to realize the National Park was a perfect resource for implementing inquiry-based, authentic experiences into surrounding schools. By this time, in the summer of 2008, I was moonlighting as a “teacher ranger”, working closely with the Park’s Resource Manager Christina Marts and Educator Director Joan Haley on ways to connect MBRNHP with classroom teachers. Rick had just taken a position as the Windsor Central Supervisory Union’s Technology Coordinator, putting him in direct contact with every classroom in our K-12 district. When we floated the idea of writing a grant to establish

“Park Research Projects”, teacher initiated units using the Park and its resources to support inquiry and place based research experiences for WCSU’s students, the Park responded enthusiastically. By June of 2009, nearly a dozen teachers were involved in Park Research, half of who implemented “exemplary units” using the Wiggins and McTighe “backward design” model. Further, FFEC’s two essential elements, the use of expert field partners combined with trusting and supporting teachers, were prominent in the Park Research model. As of this writing (January 2012), Joan Haley and Teacher Ranger Lisa Kaija coordinate more than twenty teachers and a host of expert partners - ranging from foresters, art historians, biologists, Park rangers, and even an Ivy League college!

Pomfret’s Park Research Essential Question: “What is the best habitat for salamanders, the Pogue or the Red Pine Plantation?”



Squatting in the Red Pine Plantation on a cool day in late autumn in the Marsh-Billings-Rockefeller National Historical Park, Morgan slowly lifts a square foot plywood board and peers underneath to find a red-backed salamander. Her partner, Ryan, places a tape measure along the length of the slender creature, then enters the observation onto a data sheet: Red Pine Array: Row D, Cover board #6: Red Backed Salamander. Length: 9.5 cm. Park Ranger Marguerite Auger looks on.

Teaching the AT

Given the Appalachian Trail, arguably the most renown backcountry trail in the world, happens to run through the small town of Pomfret, it would be almost a crime if I didn’t incorporate it into my place-based teaching. Still, it took another FECC alumni, Marie Hanson (Park ranger and, yes, my wife!) before the event became reality. Marie asked to “borrow” my class to teach an AT mini-unit as part of her work with A Trail For Every Classroom (a FFEC sister program). I knew better than to say “no”. So, after studying the history and lore of the Appalachian Trail, local geography, mapping, and native trees, the sixth grade class hiked the entire Pomfret section of the AT during two glorious days in the fall of 2009. In addition to getting a great deal of exercise, students wrote vivid “exploded moments” about their new understanding of the land. The two week unit and hike is now interwoven into both Pomfret’s fifth grade (taught by Sarah Woodhead) and sixth grade curriculum. For this year’s hike in April, it will be an honor to be joined by

one of the trail's earliest thru-hikers, Tom McKone. Tom also happens to be Pomfret's new principal.

**Pomfret's
Sixth Grade
Class begins
their
Appalachian
Trail hike,
Autumn 2009**



Hiking a hill so steep I can barely breath. The only thing keeping my feet moving is the beautiful scenery. Red, gold, and orange leaves cover the ground. This is one of the many things making the Appalachian Trail such a amazing trail. The other is the view and the fresh air. It feels like I can see for miles. As I breathe the cold crisp air I realize how beautiful our world really is. I feel the true glory of hiking the AT. A chill runs down my spine when the wind blows. I shiver and put my green sweatshirt back under my blue vest. I take one more look around, take a picture, and am on my way. I will never forget the feeling of hiking the Appalachian Trail. – Abbi Galotti, 6th Grade, The Pomfret School, 2011



Hailey Usilton leads Pomfret's sixth grade class up the AT in the autumn of 2009.

Walking a trail surrounded by beauty: yellow, green, brown, and red. I've never seen such color before and never seen a place like this. The hills so high. Laughing and deep breathing engulf the tight space With a whole world of yellow approaching, we feel a change of place as if we are in a new world with no one else . . . feeling the yellow seep through our skin Questions pop into my head; some can't be answered. That is the beauty of the Pomfret Appalachian Trial. - Kyle Hansen, 6th Grade, The Pomfret School, 2011

The Horizons Observatory



As long as you still experience the stars as something 'above you' you lack the eye of knowledge. -Nietzsche

*The
Andromeda
Galaxy,
Photographed
by Griffin
Boswell, The
Horizons
Observatory,
2006*



Taken a good look at the Andromeda Galaxy lately? How about exploring the great constellation of Orion whose red supergiant star Betelgeuse is thousands of times larger than our Sun, where Rigel shines with a luminosity of 50,000 suns, and where stars are being born in the stunning Orion Nebula, some 1,500 light years from our pale blue planet. Take your pick from these celestial objects or from the likes of star clusters containing thousands of suns or, closer to home, the ringed jewel of Saturn, our fusion powered, life giving Sun - even its solar wind which creates the massive curtains of reds and greens we know as aurora borealis. Or explore something no



one will ever see, a supermassive black hole beyond whose event horizon not even light can escape and whose properties resemble the singularity of the Big Bang itself.

These are but a few of the dozens of objects and topics you many choose to research, write about, photograph, and present to the others via PowerPoint multimedia. Not only is the choice of object entirely yours, but you will have full use of the Horizons Observatory, including its knowledgeable astronomy docents, its telescopes, and an astronomy library to help you observe, photograph, analyze, write about, and otherwise explore what interest you most about our universe. (Or is that “multiverse”?)

What’s the catch? Simple: You are expected to complete each of the Expanding Horizons tasks with both enthusiasm and a commitment to quality. Expanding your horizons should be both enriching and fun. Enjoy!

So reads the introduction to my students’ Expanding Our Horizons astronomy project. No other endeavor consumes me to the degree as codirecting the observatory – from teaching my Pomfret students science, researching, writing, engineering, and technology skills, to providing community stargazing events, to teaching an adult course in observational astronomy at a local college. But, since its construction in 2004, the goal of the observatory is one-and-the-same as the FFEC initiatives, to actively engage students in authentic inquiry-based experiences that foster the joy of learning.

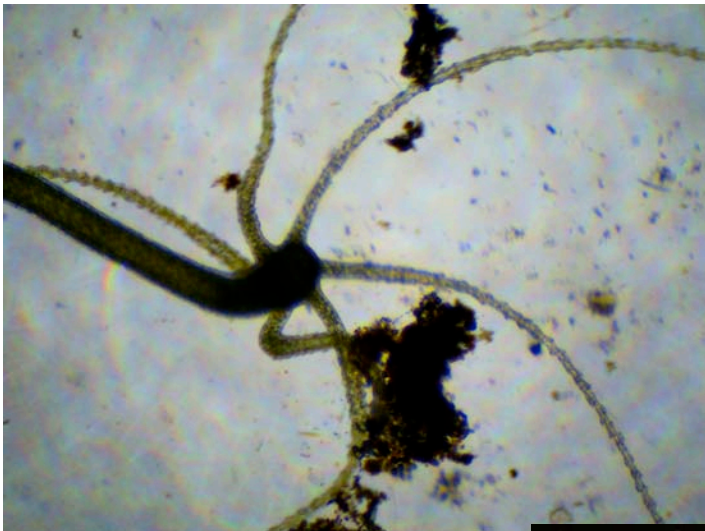
On moonless November night eleven-year old Rachel squints into the eyepiece of a telescope. “I see both of them. They’re beautiful: one is gold, the other is bluish-white. Alberio really IS two stars!” A year later, she stands in front of an audience of over forty visitors to Horizons Observatory in central Vermont giving a multimedia presentation on the nature and importance of binary star systems – including sharing her stunning photograph of Alberio’s blue and gold stars.



A Cosmic Sense of Scale

While the origin and development of the Horizons Observatory programs were independent of my FFEC experience this, too, is changing. This year my Park Research Project changed from monitoring salamanders to collaborating with sixth-grade teachers from Barnard, Killington, and Reading Schools to create “A Cosmic Sense of Scale” unit for our students. In October of 2011 these schools, along with Pomfret, came together for an entire week at the Park to answer the essential question “How does your perception of a place change when you observe on different perspectives or scales?” In mixed-school

field groups, students traversed the Park using cameras, computers, microscopes, and imaging technologies to examine the universe from the microscopic through the human to the astronomical scale. During the year each child will take a picture at the microscopic, human, and cosmic scale (using the Horizons Observatory telescopes) for both research and a public exhibit. (See <https://sites.google.com/a/wcsu.net/marshbillings/home>) Already the results are impressive. Inspired by their own wondrous photographs, my students are in the midst of creating equally meaningful research writing and media presentations on a cosmic sense of scale.



Pomfret's Patrick Potter's *A Cosmic Sense of Scale* photographs

Above left: Hydra in Pond Water (Winter 2012)

Above right: Garden Handrail in MBRNHP (unaltered, Autumn 2011)

Right: Ring Nebula (Horizons Observatory, Autumn, 2011)



*We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started.
And know the place for the first time.
- T.S. Eliot*

Although given two years to fulfill my FFEC course project, an unusually long for professional development, it should be obvious the experience did not end after the second year. Indeed now, more than twelve years after my first class, I am as involved with the FFEC staff and teachers as ever, continuing to hone the craft of teaching. As on the Appalachian Trail, professional development is a journey not a destination.

Teaching itself begins and ends with an essential question: What is the purpose of our craft? I suppose the answer is as diverse as both teachers and their students. A few of the compelling answers I've encountered over the years include developing student literacy to foster informed citizens in a democratic society, create problem solvers able to adapt to an ever-changing world, provide the skills necessary for students to achieve financial security, enhance students' understanding of the natural world, the human world, and their fundamental connection, or, simply, to teach understanding for the sake of understanding.

Yet, in my experience, one attribute is prerequisite to all significant learning: the capacity to care. Caring awakens us to ourselves, our families, our communities, our nation, our species, our planet, and, indeed, our universe. Without learners that care, teaching is fated to fail. The ancient adage attributed to Socrates, "Education is the kindling of a flame, not the filling of a vessel" remains the core of teaching, of learning, of being human. Caring led Andrew to search his heart as his feet dangled over Barnard Brook, led Rachel to glimpse the beauty and significance of Alberio's blue and gold binary stars, led a host of young adults through a tangled, twisting watershed. "*We teach our children one thing only, as we were taught: to wake up,*" writes Annie Dillard. In the end, caring awakens each of us to teach as we are taught.