



Expeditionary Learning
Learning Expedition Documentation Project

Life in a Vernal Pool

Gaining State Certification for a Local Resource

Grade 7

Expedition Authors

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With support from Melinda McCall, Jenny Tibbits, Jane Vail and Kate Conant and inspired by King Middle School's *Fading Footprints* expedition

Four Rivers Charter Public School
Greenfield, MA



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Summary

This expedition combined original scientific research, scientific writing, creative writing, artwork, political advocacy and community service, and culminated in a real-world achievement. In the spring of 2008, 36 seventh graders set off to create a field guide focused on vernal pools that not only informed the reader about the intriguing ecosystem of vernal pools, but also entertained them and fostered a sense of wonder about the natural world. In embarking on this expedition, students not only completed research about specific animals connected to or dependant on vernal pools, painted scientific illustrations, wrote field guide pages, and crafted original folktales about their animals, but also conducted fieldwork that resulted in the certification of a local vernal pool by the state of Massachusetts.



The vernal pool expedition involved in-depth classroom explorations of key state and district standards, as well as extensive research, writing and fieldwork. Science and writing were at the heart of this expedition with smaller connections to art content, in the medium of watercolor, and mathematics content in proportional thinking and mathematical similarity. The science content centered on taxonomy and the ecological concepts of habitat, adaptations, niche, food webs, population dynamics, life cycle and reproduction. It also asked students to apply geological, topographical and hydrological ideas studied

earlier in the year to the specific context of a vernal pool. The English content was built around both expository and creative writing. Students used research skills to learn about an assigned animal and then wrote field guide pages about their animals. Literacy groups were used to study the genre of field guide writing and build rubrics for how to write interesting ones. Literacy groups were used again to explore the genre of folktales before students set out to write original folktales about their animals.

Throughout the Vernal Pool expedition, students were immersed in a classroom culture of collaboration, craftsmanship and critique. While there were plenty of mini-lessons and models in use, the workshop atmosphere developed during this expedition allowed for differentiation by both interest and ability. Critique of student work from previous years was used to build an understanding of what each field guide section required. Several rounds of peer critique and workshops on different writing traits were used to revise and improve each draft. Students who needed writing support had time to conference with both peers and adults, while other students became editors and production-team members if they completed their work early in the process. Designing the cover, writing about the authors, creating a taxonomy topic page, organizing the glossary or table of contents allowed students to learn new skill or put their particular talents to use toward the common goal of publishing a high quality field guide.

OPOSSUM
(*Didelphis virginiana*)





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While the time spent out at the vernal pool was scientifically focused on species identification, mapping and documentation, it was this fieldwork that really connected students with the content they were studying. They loved being outdoors as a regular part of their school day and the certification process drove a deep need-to-know. By returning repeatedly to the same location as the seasons changed, they developed a growing sense of place and a keen connection to “their” vernal pool. They were literally knee-deep in their studies; occasionally wet and muddy, usually smiling and exclaiming over what they’d found and always deeply engaged in authentic discovery and exploration.

This expedition culminated in the publication of *Life in a Vernal Pool: Fieldguide and Folktales created by the 2008 7th graders of Four Rivers Charter Public School*, and the submission of all of the maps, observation records and forms required for the certification of the vernal pool in Highland park. Students presented their work at the whole-school Expo Night and felt particularly proud to be able to donate a copy of their book to the children’s section of the local library. Six months later, when the official paperwork came back from the Commonwealth, the students were recognized for their service and contribution to the community in an article in the local paper

Guiding Questions

- What is a vernal pool? How can we prove that the big puddle in the park is one?
- How can scientific facts and research be used to create informative, accurate and engaging field-guide writing?
- How can stories be used to create curiosity about the natural world?

Part One: Case Study of a Vernal Pool Ecosystem

Summary

This case study combined large group fieldwork with individual research and writing projects. Early in the spring, with snow still on the ground, the students tromped out to a local park to explore a seasonally wet area and to try to determine where the water came from that filled it each spring. They tried to see if anything was living under the ice. After some initial exploration, students were challenged to work together to use the Natural Heritage & Endangered Species Program’s *Guidelines for the Certification of Vernal Pool Habitat* to determine if this wet area met the criteria for certification as a vernal pool. Official certification provides a vernal pool and up to 100 feet beyond its boundary in some cases certain protection under state and federal laws. It requires applicants to measure and map the pool throughout a season, to identify and document vernal pool species, to observe their lifecycle and reproductive activities, and to classify species as obligate or facultative vernal pool organisms. In order to understand the criteria for certification, students read a variety of technical literature and applied reading strategies as they worked together to build food web diagrams explaining why vernal pools don’t just eventually fill up with leaves year





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after year and slowly disappear. Between visits to the vernal pool, students also became experts on one particular animal.

A visit to Great Falls Discovery Center, a local environmental education center focused on the Connecticut River Watershed, served as a kick off to this case study and the expedition as a whole. At the Discovery Center students began their exploration of ecosystems in general and vernal pools in particular as well as how they are connected in the larger idea of the water cycle and watershed. That day of fieldwork ended with students drawing the name of a vernal pool organism out of a hat.

They then spent the next several weeks painting a scientific illustration and researching the natural history of their animal to learn how it is connected within a vernal pool ecosystem. Not only did students use this information to craft field guide pages, but when they returned to the vernal pool, in addition to their field guides, they had the expertise to confirm the identity of each organism they fished out of the pool, extracted from under rocks, or caught in their nets. In the classroom, their writing improved through the process of critique and peer editing. Students began to see the predator/prey relationships and other ecological connections between their animals as they read each other's work. Armed with more information each time they headed out to the pool, the students hoped that each trip would be the one in which they would be able to observe their animal in the wild. In the field, they made observations that sharpened their descriptions in their field guide writing and collected the data that lead to the eventual certification of the site as a vernal pool.



Part Two: Writing Original Folktales

Summary

In this part of the expedition, students were challenged to take the information and facts they learned about their animal and use them to write an original folktale that described the origin of some aspect of its appearance or behavior. The primary audience for the publication was elementary school-aged kids from all grades.

Work on the folktales began with investigating the key characteristics of myths (connecting to our ancient civilizations curriculum in social studies), legends and folktales. Students read and discussed elements of each kind of tale in literature groups and whole class investigations. They also read and discussed animal stories by Thornton Burgess that borrowed heavily from the folktale tradition. Special attention was paid to how Burgess used scientific facts about animals to create interesting animal characters with personalities that reflect real animal behavior. Local story-tellers were also brought in at this point to share ways in which characters and plot can really bring a story to life for audiences.



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Students then set out to write their original folktales about their animal. Throughout the writing process they checked their work against the list of elements of folktales they generated earlier in the investigation. Stories were revised, reviewed by peers and revised again before being submitted for even more comments and revision work. Finally, completed folktales were moved into InDesign publishing software along with field guide pages and original watercolor illustrations of their animals in preparation for publication.

Major Projects

This expedition included two related projects, one fieldwork based community service project with an audience beyond the school, and one major publication with substantial discrete components. For each component of the publication, students participated in mini-lessons, reading, writing and critique/feedback/revision processes. Work sessions on the components of the Vernal Pool Field guide were punctuated and augmented by visits to the vernal pool. It is important to note that these projects were concurrent rather than consecutive. For some students it was the visits to the vernal pool that enlivened their research and writing process, and for other students becoming more expert in the material in the classroom led them to become more curious, vigorous and engaged explorers out in the field with each visit.

Project One: Vernal Pool Certification - Community Service Project

Description

Official certification provides a vernal pool, and up to 100 feet beyond its boundary in some cases, certain protections under several state and federal laws. In order to determine if the really big puddle in Highland Park met the criteria to be certified as a vernal pool, students used the Natural Heritage & Endangered Species Program's *Guidelines for the Certification of Vernal Pool Habitat*. The certification process required students to describe the location and distinctive features of the pool in detail, to measure and map the pool throughout a season, to identify and document vernal pool species, to observe the lifecycle and reproductive activities of vernal pool organisms, and to classify species as obligate or facultative vernal pool organisms.

Each student was given an enlarged copy of the *Vernal Pool Field Observation Form* that they would eventually submit to the Natural Heritage and Endangered Species Program at the Massachusetts Division of Fisheries and Wildlife. This served both as a reminder of what to look for and a data sheet for students to use in the field. In order to use this form correctly, students needed to be able to identify egg masses, larvae and transforming juveniles of several obligate amphibian species and coordinate as a group to avoid counting the same organisms twice. They also used scoop nets looking for fairy shrimp,





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aquatic insect larvae or nymphs, leeches, fingernail clams and snails. Each find had to be documented with dates, counts and photographs. Because the pool was close enough by to visit in one double-block math/science class period, the students usually did fieldwork one class group at a time. The second class to visit in a day was able to independently verify the counts and data of the first class, making sure the data was accurate and complete. They also quickly learned that the two hour difference in visiting time sometimes provided just enough time for the temperature to rise significantly enough for the cold-blooded amphibians to be far more active for the second vernal pool visit of the day. This is just one illustration of how scientific ideas from the textbook such as warm-blooded vs. cold-blooded creatures, came to have concrete examples and applications in our fieldwork. Literally, the fieldwork made the research components of the project “come alive” for students.

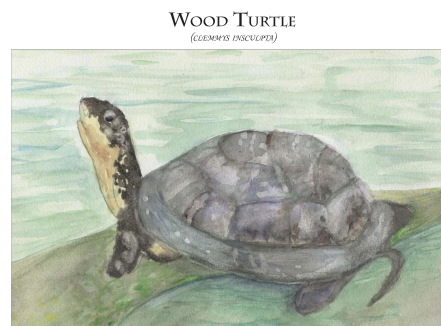
Project Two: Life in a Vernal Pool Field Guide

Description

This field guide was a major publication with six significant components and extension options.

Watercolor Painting and Scientific Illustration

Students were asked to create an accurate, scientific illustration of their assigned animal in its habitat. To launch this section of the project, the art and science teachers worked together to introduce students to the work of John James Audubon. They focused on drawing and painting as a component of detailed scientific observation and how art has been used by naturalists as a way of documenting new species of animals. Art and Math class were combined once more as students learned to apply their skills with mathematical similarity and proportional thinking to use a grid drawing method to create scaled up drawings from photographs of their animals. In art class, students continued to work toward the challenge of making beautiful and accurate illustrations for their field guide beginning with mini-lessons designed to help them learn to control the medium of watercolor to create washes, textures and, ultimately, two dimensional compositions which give the illusion of three dimensions.

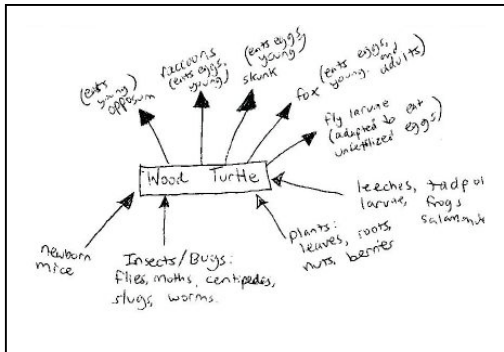


Diet and Feeding Habits – Food Web Diagram with a Caption in the Form of Bullet Points

With much of the animal research for the field guide being communicated in writing, by the mid-point of the expedition students were ready for a break from writer’s workshop. Lessons focused on defining vernal pools had already introduced students to the idea of food webs and food chains. Following some reading and mini-lessons focused on trophic levels and energy pyramids, students were assessed on their knowledge of how energy flows through ecosystems. They were challenged to create a food web diagram centered on their assigned animal with accompanying captions in bullet point form. After a gallery of first drafts, together with teachers,



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students created a rubric defining what makes a clear and understandable food web and how bullet points should enhance, explain, or give more detail about the diagram. In the context of food webs, critique not only yielded final products with better craftsmanship, but also a deeper understanding, with more specific examples in their writing, of the interconnectedness of a vernal pool ecosystem. In typical middle school fashion, these connections often rang out across a classroom sounding like, “Hey, my animal eats your animal for breakfast! I’m adding that to my final draft.”

Physical Description

How will a reader be able to use this field guide in order to identify an animal in the wild? Students needed to describe the movement, sound, color, shape, size and measurements of their vernal pool animal accurately and vividly enough for a young reader to picture the animal. In their research, students frequently encountered new vocabulary in the names and definitions of unique body structures and in descriptions of differences between young and adults and between males and females of the species. Students who wanted to use their newfound words in their writing were invited to add their words, with a paraphrased definition, to the growing glossary for the field guide which already contained the scientific vocabulary words that students were required to work in to their writing. This section of the field guide was perfect for exploring descriptive writing and writer’s workshops focused on the writing traits of *ideas* and *voice*. The more scientific challenge was for students to help a reader understand how the animal uses its internal and external physical features as adaptations to meet its needs and survive in its particular habitat. In writing this section of the field guide, students were able to put to use their careful observations of color and texture from their art class watercolor projects.

WOOD TURTLE	
PHYSICAL DESCRIPTION	HABITAT
Just visible under the murky water, you see a brown-gray turtle, with red-orange eyes, neck and legs. This is a wood turtle and its main color varies from the common gray-brown that you saw to an olive color. The young wood turtle looks about the same as the older except smaller and with slightly duller coloring. Before they hatch, their eggs are white and about the size of a golf ball. Females and males look about the same, although the males tend to have a longer tail. The average wood turtle is 7-9.5 inches long and has engraved/carved patterns on its shell. If I were to say “worm stomping” what would you think of? Maybe an Irish step-dance, an adolescent picture book, a primitive form of hunting...? Actually, it is an adaptation of the Wood Turtle. To get the food they want, the turtle will stomp on the ground until the worms emerge for fear of being squashed underground, and are rewarded by promptly being eaten. Other adaptations of the wood turtle are hibernating under the mud (in winter), the hard shell that protects it, and their surprising excellence with climbing. The wood turtle is a vertebrate, which means that it had a notochord (commonly a backbone) and bone structure. Unlike most other vertebrates, their backbone isn’t in the form of a spine (like yours). Instead, it is a hard shell on their back. The shell allows them to hide, and protects them from attack. The wood turtle is also a cold-blooded reptile which basically means that instead of maintaining their own body temperature (like warm-blooded creatures such as humans, and most mammals), cold-blooded animals’ bodies are the same temperature as their environment and things that surround them. This is another adaptation that prevents them from using energy on staying warm. But, this also means that when it’s cold out... let’s just say the turtle won’t be running any marathons.	The North American Wood Turtle emerges from the mud at the bottom of the vernal pool in Massachusetts, after a long winter’s hibernation. Spring begins: causing snow to melt, and the vernal pools to fill with water from run-off. During the 3 seasons of Spring, Summer and Fall that come along with the climate, the Wood turtle lives near the water of the Vernal Pool. He fills his niche by eating berries, plants, nut, insects and worms on land during this time, eating amphibians (both eggs and adults) in the water, and hibernating burrowed in the mud which he will do every winter for 30-50 years. The Wood Turtle’s companions in these months at the vernal pool are other turtles, fairy shrimp, clams, snakes, fowl (ducks), insects, plants, trees and mammals such as raccoons and weasels. These organisms frolic beside the abiotic factors of water, mud, leaf litter, rocks and other sediments. The Wood Turtle’s range is from Nova Scotia to North Virginia, where it is found in fresh water habitats like vernal pools, streams, rivers and a few lakes. They live mainly on land but usually nearby running water.

Habitat

This written section challenged students to give their reader a clear description of the climate and physical features of the animal’s required habitat and range: Where and when should a reader go to observe your animal in the wild? How and when is your animal connected to a vernal pool? What particular part or season of the vernal pool does your animal use? Throughout the year, student’s worked on supporting their statements with details – reasons and examples – but the writing of the field guide provided the opportunity to work on doing so with more fluency.



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Natural History = Taxonomy and Lifecycle

In order to write a clear and understandable description of their animal's life history, students needed to understand the differences between several Orders in the Animal Kingdom. An earlier classification poster project introduced students to the concepts of classification and taxonomy but it wasn't until they had to describe lifecycles in detail that they really ran up against the differences between incubation and gestation or between gradual and complete metamorphosis. In each written section of the field guide, students were required to choose a certain number of scientific vocabulary words from a set that they'd learned from their reading or mini-lessons to include in their writing. So often science textbooks begin with vocabulary and students believe they understand the ideas when they have memorized the words, but once they had researched and understood the lifecycles of the animals they were studying, students struggled to get the correct terminology connected with the processes. The research and writing process gave students more time to make connections between the new words and the animal they'd come to know so well throughout the expedition. Peer editing for this project had to focus on content as well as *voice* and *fluency*. While students were required to include taxonomy and lifecycle information, the writing of this section also gave students a place to include fascinating facts or observation from the vernal pool fieldwork that didn't fit into any other report section.

Folktale

After an extensive period of researching and reporting facts, students were asked to think creatively about their animal. Writing for a younger audience meant having to provide the reader with a sense of wonder about the natural world along with the rich information of the field guide. The genre of folktales provided the perfect place for both fact and fiction to work together to entertain. Students were asked to bring their animals to life for young readers by creating characters with distinct personalities. In addition to rich characters,

their original stories also had to contain essential plot elements of a conflict and a resolution that led to a creative explanation for a physical aspect or interesting behavior their animal possessed or exhibited. The genre of folktale requires walking a fine balance between fact and fiction. Animals had to be characterized enough to foster a connection between them and the reader, but not contain too many points of departure from reality to make the story outlandishly unbelievable. The tales had to be entertaining and creative while also bringing to life the facts about the animal and its connection to vernal pools. During this part of the expedition it was not unusual to find students planning, drafting and revising with the watercolor illustrations of their animals in front of them.

Extension Options

Students inevitably moved at different paces through the process of writing and revising (and often revising again) based on peer and teacher feedback. The goal of publishing a complete

Why the Wood Turtle has an Engraved Shell

Timmy Turtle plodded slowly down to the vernal pool. After catching a few worms, he dove into the water in search of his favorite meal: tadpoles. While gliding above the leaf litter, he saw a slight commotion at the top of the water. As soon as he surfaced, he saw a duck floating with a frog in its mouth. As he watched, the duck balked and flew away upon the sight of what was coming down the path. A fox.

The fox leaned persuasively, "Timmy Turtle, won't you come over here? I have a nice collection of tadpoles over at my den if you want some." Timmy Turtle, being a glib and friendly fellow, said "Really? That would be awesome. Thank you so much!" Fox smiled, displaying his sharp white teeth. Timmy lumbered as quickly as he could after the swift canine, and called out to the other turtles, "Come on, he's got lots of tadpoles in his den!" They all stared back wide-eyed at his stupidity. Puzzled by their refusal, Timmy Turtle followed Fox until they reached his den.

He inhaled, expecting to find the fishy pungent smell of tadpoles, but none reached him. Suddenly it occurred to him why the other turtles wouldn't come. Foxes are fond of eating wood turtles.

After his moment of realization, Timmy's blood

chilled (and stayed that way) with dread as he tried to

turn around unnoticed to escape the hungry fox. But Fox

was upon him, slashing at his shell in frustration. Blood

ran down the inside of Timmy's legs, his neck and his

eyes, dying them all red.

Timmy saw the vernal pool glinting in the distance, and staggered towards it with Fox still attacking him. He tripped into the water, felt Fox's grip loosen. Fox ran off, shivering and wet, but not before many gashes were left in the tired turtle, making it look like his shell was engraved or sculpted. Timmy Turtle survived, and had many children with his wife Tabitha Turtle and they all had engraved shells. Because of Timmy's foolishness, all wood turtles have engraved shells, cold blood and red eyes, legs and necks.

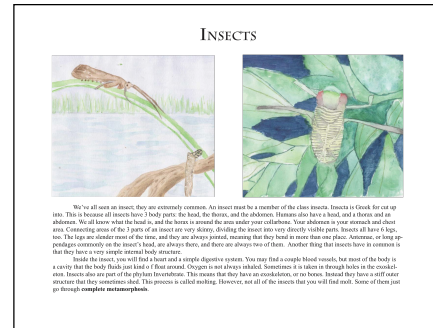


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field guide provided an authentic place for students who finished their sections early to continue to contribute or collaborate in the creation of the book. Students who needed writing support had time to conference with both peers and adults, while other students became editors and production-team members if they completed their work early in the process. Designing the cover, writing about the authors, creating a taxonomy topic page, organizing the glossary or table of contents allowed students to learn new skills or put their particular talents to use toward the common goal of publishing a high quality field guide.

Final Product

The field guide itself was the final product for this project.



Content and Skill Standards Assessed in the Learning Expedition

Reading

- I can locate appropriate reference materials for my assigned vernal pool animal and record bibliographic information for each reference source I use.
- I can take notes in my research packet on my vernal pool animal by paraphrasing what I read.

Writing

- I can choose an appropriate pre-writing strategy to organize details and information from my research to describe the appearance and adaptations of my vernal pool animal, the conditions and factors my vernal pool animal needs to live, and the life cycle and taxonomy of my vernal pool animal.
- I can use the traits of ideas, sentence fluency, organization, and voice to write, revise, and edit informative pieces and original folktales based on research.

Math

- I can use proportional reasoning and the properties of mathematical similarity to identify and construct similar figures on a coordinate grid and in real-world measuring applications.
- I can use ratios and proportions in the solution of problems, involving unit rates, scale drawings and reading of maps.
- I can select the appropriate tool, units and methods to measure the depth, length and width of the vernal pool.

Character (performance and relational)

- I can demonstrate good craftsmanship when working with a variety of art materials.
- I can work collaboratively with peers in the writing process.



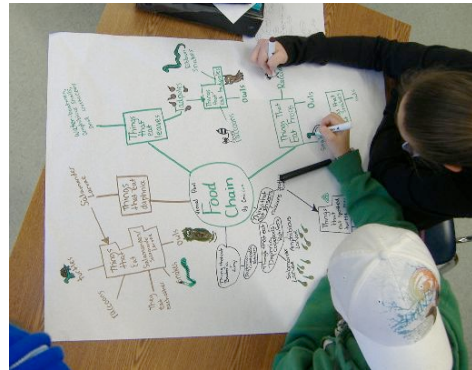
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- I can participate safely and responsibly in vernal pool fieldwork; this means acting in a way that cares for my group, the environment, and me.

Science and Technology

- I can define what makes a vernal pool a unique ecosystem in terms of its water cycle, fauna and food web.
- I can explain what an indicator organism is and describe the difference between obligate and facultative vernal pool organisms.
- I can explain at least 4 ways that human activities impact vernal pool ecosystems and at least 3 reasons why vernal pool habitats need to be protected.
- I can locate our vernal pool correctly on a topographic map and create an accurate scale map of my own.
- I can define and describe the physical and temporal components that make up an animal's habitat using specific examples based on the animal I am researching.
- I can explain what adaptations are using specific examples of how my assigned animal is adapted to its particular habitat.
- I can create an accurate food web diagram showing where the predators and prey of my vernal pool organism get their energy.
- I can use bullet points as a caption for my food web diagram to add details about the trophic level and feeding adaptations of my animal.
- I can describe the lifecycle of my assigned animal.
- I can classify my assigned animal in the correct Kingdom, Phylum, Class, Order, Family, Genus and Species.



Social Studies

- I can understand and navigate the official government process for obtaining vernal pool certification.

Visual and Performing Arts

- I can use grid drawing technique to scale up photographs into correctly proportioned drawings.
- I can identify the scale factor from my photograph to my drawing and from my drawing to my photograph.
- I can use watercolor to craft a two-dimensional scientific illustration of an animal in its habitat.
- I can craft two-dimensional compositions which give the illusion of three dimensions.

Health and Wellness

- I can do vernal pool fieldwork in adverse conditions.



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Connections to State and District Standards

Science

- Characteristics of Living things
 - Organisms are classified into kingdoms.
 - Species are reproductively distinct groups of organisms. Species are classified into a hierarchical taxonomic system based on similarities.
- Living Things and Their Environment: Ecology
 - Organisms interact and have different functions within an ecosystem that enable the ecosystem to survive.
 - Roles & relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.
 - Dead plants and animals are broken down by other living organisms, which contributes to the system as a whole.
 - Producers use energy from sunlight to make sugars through photosynthesis, which can be used immediately, stored for later use, or used by other organisms.
- Heredity and Genetics
 - Sexual reproduction and asexual reproduction.
- Structure of the Earth
 - Earth's common physical features can be represented with models and maps.
- Earth Processes and Cycles
 - Water flows into and through a watershed.
 - The hydrologic cycle includes evaporation, condensation, precipitation, surface runoff and groundwater percolation, infiltration, and transpiration.

Math

- Use ratios and proportions in the solution of problems, involving unit rates, scale drawings and reading of maps
- Given the formulas, convert from one system of measurement to another. Use technology as appropriate.

English

- Understand and acquire new vocabulary and use it correctly in reading and writing.
- Analyze standard English grammar and usage and recognize how its vocabulary has developed and been influenced by other languages.
- Write and justify a personal interpretation of literary, informational, or expository reading that includes a topic statement, supporting details from the literature, and a conclusion.
- Write multi-paragraph compositions that have clear topic development, logical organization, effective use of detail, and variety in sentence structure.
- Select and use appropriate rhetorical techniques for a variety of purposes, such as to convince or entertain the reader.



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- Revise writing to improve organization and diction after checking the logic underlying the order of ideas, the precision of vocabulary used, and the economy of writing.
- Improve word choice by using a variety of references.
- Use knowledge of types of sentences (*simple, compound, complex*), correct mechanics (*comma after introductory structures*), correct usage (*pronoun reference*), sentence structure (*complete sentences, properly placed modifiers*), and standard English spelling when writing and editing.
- Organize information into a coherent essay or report with a thesis statement in the introduction, transition sentences to link paragraphs, and a conclusion.
- Apply steps for obtaining information from a variety of sources, organizing information, documenting sources, and presenting research in individual projects:
 - differentiate between primary and secondary source materials;
 - differentiate between paraphrasing and using direct quotes in a report;
 - organize and present research using the grade 7–8 Learning Standards in the Composition Strand as a guide for writing;
 - document information and quotations and use a consistent format for footnotes or endnotes; and
 - use standard bibliographic format to document sources.
- As a group, develop and use scoring guides or rubrics to improve organization and presentation of written and oral projects.

School Standards

- Use critique to build rubrics for quality work.
- Work collaboratively with peers in the writing process
- Make use of feedback to make revisions to work.
- Persevere in the pursuit of high quality work.
- Investigate humans' connection to and responsibility for the natural world.



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Connections to the Community and Larger World

Fieldwork

- Great Falls Discovery Center
- Greenfield Library
- 5 visits to the vernal pool in Highland Park

Experts

- Local public library librarian
- Staff at Department of Fish and Wildlife
- Educator at Great Falls Discovery Center

Service Learning

- Certifying the Vernal pool

Exhibitions

- School wide Expo night
- Presenting a copy of the field guide to the local library as a “thank you” for all the help they gave with the research
- Article in the local paper when certification came back from the state (6 months after original project completion)



School report results in state vernal pool designation

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BY ANITA FRITZ RECORDER STAFF
[email this writer](#)

[Originally published on: Tuesday, February 03, 2009]

GREENFIELD -- Thomas Perham and Tristen Conolly say they never imagined their seventh-grade project would lead to anything more than a better understanding of vernal pools and a good grade.

But at the end of last week, they learned all of their hard work had paid off in a much bigger way. The vernal pool they have explored at Highland Park for months has now been certified by the state -- thanks to them and their 34 classmates.

A vernal pool is a pond that appears in the spring with the melting of winter snows



Four Rivers Charter School students work on research on a vernal pool near Highland Pond in Greenfield. Their research resulted in the state designating that area as a protected vernal pool, the first in Greenfield.



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Calendar

March	April	May	June
• Kick-off • Research workshop • Library Research • Genre study of field guides • Introduction to water color • Write and revise Physical Description section of field guide. • Fieldwork at Vernal Pool. ○ Introduction to Vernal Pool habitat and hydrology.	• Write and revise Habitat section of field guide. • Write and revise Natural History section of field guide. • Create Diet and Feeding Habits diagram. • Assemble and revise field guide section from completed drafts. • Begin genre study of Myths, Legends and Folktales. • Weekly work on watercolors in art class. • Fieldwork at Vernal Pool. ○ Animal species inventory and survey ○ Sampling methods	• Complete genre study of Myths, Legends and Folktales. • Write and revise original folktales. • Finish watercolor illustrations of animals. • Complete extension options. • Import writing and artwork into InDesign publishing software. ○ Publication Crew work on assembling book. ○ Fieldwork at Vernal Pool. ○ Animal species inventory and survey and life cycle observations.	• Presentation of Learning at Expo Night. • Publication Crew work on assembling book. • Print and assemble book. • Fieldwork at Vernal Pool. ○ Vernal Pool measurements and mapping. • Presentation of our Publication to local library. • Submit Application for Vernal Pool Certification to the state (Certification received 6 months later).