



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute

1999 Volume VI: Human-Environment Relations: International Perspectives from History, Science, Politics, and Ethics

Edgewood Speaks: Politically, Historically, Scientifically and Ethically

Curriculum Unit 99.06.05

by Mary Stewart

The natural proximity of the Edgewood Park and the West River to Edgewood School creates an outdoor classroom for extended and comprehensive research and observations. Our students are the perfect explorers to ride the rivers, document the environment and present their results. Their perspectives will engage their peers, encouraging them to claim ownership, pride and responsibility for the park, its wildlife, vegetation and watersystems.

Wildlife and water systems in our urban area have been underused and under appreciated. This has an adverse effect on public access, habitat restoration and research. If the community members do not feel connected to the natural environment they will not feel responsible for it either. For this reason public outreach and education is the key to the success of our preservation and evolution of public areas such as Edgewood Park.

I believe students and educators must experience Edgewood Park on a minimum of three levels to achieve ownership:

- Esthetically: The production and creation of a schoolwide exhibit.
- Scientifically: The study of currents, erosion and land sculpting .
- Physically: Field exploration of Edgewood Park and the West River.

Our 8th grade will begin a 10 week study posed with a single question: What is an honorable relationship with nature? (1) Their task will be to present an answer , in the form of an exhibit, that includes evidence of scientific and historical research as well as a basic knowledge of currents, erosion and land sculpting of the West River. Weekly readings and discussion sessions will be based on Lester Milbrath's, Learning to Think Environmentally: While There is Still Time. It is important that a balance between individual and group experiences be facilitated by the lead educator. These dialogs will be the scaffolding that supports and nourishes the ethical perspective of the individual projects.

The exhibits will represent the individual's perspective, learning styles and interest. Progress will be monitored

by the educator and student through weekly meetings. This team will produce rubrics for exemplary work, striving to measure individual progress.

Students will establish working portfolios containing individual rubrics, in progress work and conference assessments. Each of these documents will hone skills in the following areas; goal setting, editing for publication and research. The exhibit will be opened to the public, with our 8th grade students acting as docents.

The exhibits will fall under four main categories:

- Publications: children's literature, historical fiction, poetry or playwriting.
- Film/Photography: a slide/photography presentation, or original film.
- Two Dimensional Art: botanical drawing, painting or political cartooning.
- Three Dimensional Art: sculpture.

Communicating historical, political, scientific and ethical perspectives in such a manner naturally creates literate individuals. Literacy is often associated solely with reading and written communication. Readings and writing are tools to achieve literacy, but true life long literacy depends upon the acquisition and application of historical, political, scientific and ethical concepts and experiences. Lev Semenovitch Vygotsky's theory of social and cultural experiences is that all uniquely human, higher forms of mental activity are jointly constructed and transferred to children through dialogues with other people (2).

Educators, as well as students need to become comfortable with and gain an intrinsic understanding of a common core of political, historical, scientific and ethical language in order to carry on such dialogues. Therefore, it is imperative that we acknowledge the importance of language acquisition in these areas if we hope for our children to become literate adults. This interpretation of literacy is based on the vision that each individual has the right, in a democratic society, to guide their own destiny. Students regardless of gender, economics or race are entitled to and deserve such an educational environment.

As students identify the audience they wish to address, as well as the desired outcomes, they will be engaging in and leading import discussions as they answer the question:

What is an honorable relationship with nature?

Objective:

Assist students to achieve a greater understanding and appreciation for the intrinsic connection between humans and the environment.

This unit will also directly address the New Haven 8th grade science content standards (3) numbers 4.0 in regard to local geology, erosion and water systems and weather; 6.0 in regard to the impact of technology and its use to understand characteristics of changing populations, natural resources and the consequences of human behavior.

Unit Time Line

- Week 1 Pose the question: What is an honorable relationship with nature?
 - Engage in dialogs to define the terms
 - Chapters 1&2 in Learning to Think Environmentally
- Week 2 Introduce Edgewood Park as a local case study
 - Establish working portfolios as a resource for student exhibits
 - Research the history of Edgewood Park
 - Chapters 3&4 in Learning to Think Environmentally
- Week 3 Time line construction
 - Open space in urban areas
 - Chapters 5&6 in Learning to Think Environmentally
- Week 4 Research Belford vs. New Haven
 - Engage in dialogs to define the terms
 - Set up a debating session to present each perspective
 - Chapters 7&8 in Learning to Think Environmentally
- Week 5 Identify and interpret effects of change
 - Produce the mural
 - Chapters 9&10 in Learning to Think Environmentally
- Week 6 Build vocabulary through the use of River Cutters
 - Chapters 11&12 in Learning to Think Environmentally
- Week 7 Build the West River
 - Chapters 13&14 in Learning to Think Environmentally
- Week 8 Rate of flow on erosion and land sculpting
 - Choose exhibit topic
 - Chapters 15&16 in Learning to Think Environmentally
- Week 9 Independent research
 - Design rubrics
 - Chapters 17 in Learning to Think Environmentally
- Week 10 Independent research
 - Build exhibits
 - Invite the audience
 - Debrief

Edgewood Park: Ethically

To answer the question, "What is an honorable relationship with nature?", we must first understand the language. Students must therefore engage in activities that support the acquisition and accommodation of key terminology and concepts.

Building Vocabulary: Defining Environmental Terminology

The entire unit will begin and end with this question. The students will be asked to define the terms, "honorable", "relationship" and "nature", using the CD-ROM version of the Oxford Dictionary. This piece of software will not give them the simplistic definition they expect, but a barrage of definitions based on multiple perspectives. This exercise will create a natural need for dialog and class discussions to clarify the terms and their use. Students will be expected to formulate definition and apply them throughout their study of Edgewood Park .

Ethics and the Environment

Lester Milbrath wrote Learning to Think Environmentally in plain language as a dialog between two neighbors. The nature of the book encourages questions and interactions between individuals. Each chapter is no more than eight pages with large print. His text will act as a model for the students as they engage in similar dialogs after weekly reading sessions. We will build vocabulary based on individual chapters.

Each student will have their own copy of Milbrath's book to read. In addition photocopied chapters will be given to each student. They will be expected to directly write notes on the text and highlight vocabulary . This exercise will be therefore encourage questioning and interactions between individuals. As the weeks progress students will gain confidence in their ability to discuss ethical issues in the environment. Each student will have a response journal to be complete at the end of our weekly dialogs. The journal will be part of their working portfolio.

The use of Milbrath's book directly addresses my unit objective: to assist students achieve a greater understanding and appreciation for the intrinsic connection between humans and the environment. He explores the interdependency and delicate balance of biological, geological, and chemical systems. He believes a sustainable path towards our future is rooted in environmental thinking. The ethics involved in such thinking will be debated weekly during our unit Edgewood Speaks.

Edgewood Park Historically: Change Over Time

"Wanted-A farm, of not less than a hundred acres and within three hours of the city. It must have a running stream, a southern or eastern slope, not less than twenty acres of wood an a water view." (4)

We will trace the history of Edgewood Park from Donald Grant Mitchell's ad in the local paper , to include acquisition of land on the east side of the west river, removal of the almshouse, construction of memorials, the

work of Frederick Law Olmsted, Jr., the work of Beatrice Farrand, and the park renovations slated for the year 1999-2000 (5).

Understanding the impact of time can be an extremely abstract concept for adolescents. The physical construction of the time line will allow each student to have an active role in reconstructing the history of the park. It will be a visual tool used to gain a greater understanding of our relationship in time. Once we establish a basic framework historically we can begin our study of Edgewood Park and the West River ethically, scientifically and politically.

Donald G. Mitchell's dream of a farm, "not less than a hundred acres-within three hours of the city", became a reality when he and his wife purchased and moved into a 360 acre farm just above Forest Road where they lived from 1855 until Donald's death in 1908. They named their home Edgewood. The success of Central Park in New York City spurred the urban park movement in the United States. Mitchell was the premier park planner in New Haven as well as a renowned writer under the pen name Ik Marvel (6). A collection of his writings, including *My Farm At Edgewood*, and *Wet Days At Edgewood*, are housed at the Mitchell Library on Harrison Street in the Westville section of New Haven. They may be viewed by appointment and availability. Mitchell believed in the organized planning and beautification of his beloved home, Edgewood, and his city, New Haven. East Rock, Fort Hale and the now extinct Bayview(7) parks were planned by Donald G. Mitchell.

Mitchell, in 1889, donated much of the land west of the West River. He also encouraged his friends to donate parcels with his. The acquisition of the land east of the river was put in the hands of the city who later turned it over to a newly formed organization in New Haven, the Parks Commission. And so Edgewood Park was born.

Time Line Construction

Each student will be required to include a reproduced primary document, photo, object or pertinent image as evidence of their research. One wall in our class will be dedicated to our time line. The following dates will act as a skeleton. These dates will focus the students as they decide what other information and/or events should be included in our time line.

Important Historical Dates in Edgewood's History

1884 Donald Mitchell places his ad for a farm.

1885 Purchase of the Mitchell farm in New Haven, CT. It was named Edgewood.

1889 Donald Mitchell donates land west of the West River to City of New Haven. He persuades residents to do the same. The city acquires land east of the river. The Parks Commission is formed and the land turned over to their governance. The almshouse is moved from the upland area of the park to the Springside neighborhood. West Side Association is formed.

1899 Bronze statue of a soldier honoring Spanish American War veterans is dedicated in the upper park.

1910 Frederick Law Olmsted, Jr. makes recommendations for park enhancement.

1920 Athletic and recreational facilities to include a rowing course built. The New Haven Rowing Club used these facilities regularly.

1937 Beatrice Farrand designed the lilac and rhododendron garden while a student at Yale.

Design and installation of the Holocaust Memorial

1975 Belford vs. New Haven decision reached.

1989 Renovations based on Mitchell's views of open space are planned.

1999 Renovations based on reviving community interest in open space are implemented

Research Tools

Students will use the archives and libraries available through The Connecticut Newspaper Project(8) and The New Haven Colonial Historical Society(9) to collect articles, interviews and images that will make the time line a personal as well as historical journey. Once the information is located and selected by the students, an adult will need to arrange for the reproduction and delivery of the materials per each organization. The Newspaper Project is accessible via the internet for research locations and has email capability. The Historical Society must be visited by appointment.

Open Space in Urban Areas

Once the time line is completed the class will address the issue of open space in urban areas by examining current park associations and maps. A group of proactive citizens formed The West Side Association in 1889. They were the first group of residents to address the right of public access to open space in parks. Today The Friends of Edgewood Park are once again addressing these issues. Most interesting in Edgewood Park's history is the ability of the average citizen or citizen group to become a catalyst for change. The Friends of Edgewood Park (of which I am a member) will be invited to share with the class how they could effect change today.

The shrinkage of open space can be examined visually with the use of the University of Connecticut's website MAGIC. Included in the time line will be maps students can review and download from MAGIC. We will begin with an examination of the United States of America map by H.S. Tanner, 1834. 4th. edition. It affords one the opportunity to view the United States and choose gridded sections to zoom into. This zoom effect is a very powerful tool for students to understand their relative place in space and time. Six historical maps of New England and Connecticut between the years of 1621 and 1930 are available to supplement more recent and accessible maps. The physical maps will assist us as we discuss the shrinkage of open space and how this effected the decision of Donald Mitchell to begin the parks movement in New Haven.

Rate of Change

Cooperative groups will calculate the rate at which open space changed between 1834 and today. The maps and the calculations will be added to our time line. Physically attaching each map to the time line will assist students understanding the relative time between each new change.

Edgewood Park Politically: Belford vs. New Haven

The Case

The Defendant: A nonprofit organization, The International Rowing Course Foundation upon entering an agreement with the City of New Haven.

The Terms: The foundation will have the right to promote, organize and operate competitive and non-competitive rowing events. Their goal is to attract major events to include; olympic, national and international rowing. This project will require "105 of the 295 acres" of park land (10). The new rowing course would require the dredging of the West River to a depth of 8 feet, width of 420 feet, and length of 2000 meters(11). Stands to accommodate " five thousand spectators" (12) and demolition of the Chapel Street bridge will be also required. The stands will be located along the river and the bridge demolished to construct a road through the

park. The Foundation stated that at the time of this case the rowing course area had "limited wildlife resources" (13) and "minimal damage to wildlife resources would occur" (14). They further stated that this will have "no effect" (15) on air pollution. Public access will be unrestricted to a mini Olympic Village to include; an olympic sized pool, baseball field, football field, softball field, care taker home. Admission fees would be charge. Public access to the river will be limited to after 1p.m. on non-reserved Sundays March through June, after 1 p.m. week days and all day Saturday and Sunday, except when reserved, July through October.

The Plaintiffs: Residents and taxpayers of the City of New Haven, CT.

The Terms: Their goal id to prohibit the mayor and the city from leasing sections of Edgewood Park and the West River Memorial Park to The International Rowing Course Foundation, thus prohibiting the construction of an olympic rowing course and village. They also request the review of the project by the commission of environmental protection to report on the impact this project will have on the "public's trust" (16) in the air, water and all other natural resources. The plaintiff's state that "the plaintiffs are residents and taxpayers of the defending city of New Haven, are members of the public for whose benefit the public parks within said city are operated, managed and maintained, and are persons for whom a public trust has been established in the protection, preservation and enhancement of the air, water and other natural resources of the State of Connecticut within the meaning and intendment of Section 22a-15 of the General Statues of Connecticut." (17)

Building Vocabulary: Defining Political Terminology

Once the court case is presented the students will define defendant, plaintiff as a class. Students will work in cooperative groups accessing information on two terms or phrases. Each group will be responsible for documentation, to include appropriate citation and acknowledgment, and oral presentation of information from one hard copy print , two on-line and one human resource, defining each term or phrase.

Groups will choose from the following list:

- nonprofit organization and foundation
- limited wildlife resources and minimal damage to wildlife resources
- commission of environmental protection and no effect
- public's trust and public trust
- residents and taxpayers
- leasing and public parks

The class will come to consensus, through class meetings, on the terminology we will adhere to during Edgewood Speaks. Dissenting views will be encouraged to be explored and defended during individual

exhibits. Each class meeting will begin with a written agenda stating the terms to be discussed, debating guidelines and time frame for consensus. This model will be built by students for students in an effort to be as inclusive of diverse views while understanding the need for any community to have common use of language. Prior to such meeting the students must agree that each member of the community will at some time have a dissenting view. These diverse views will, during our study, become the basis of many student exhibits.

The agreed terminology and definitions will be posted as a reference tool for the class. We will now be ready to apply them to Belford vs. New Haven and acquaint ourselves with actual text. During this process students will be asked to use their definitions to communicate the symbiotic and parasitic nature of the relationships that arise between Edgewood Park and the proposed project in Belford vs. New Haven. A very simple yet effective tool to help students understand symbiotic and parasitic relationships is the use of clams from the Long Island sound. Schooner, Inc. (17) will set up a salt water tank in the classroom. Students will then collect clams that have barnacles living on them in a symbiotic relationship. Tube dwelling worms on clams represent the parasitic relationship. The larger the area taken over by the tube dwelling worm, the greater the rate of decay of the clams. I would directly pose the question: Is it possible for a relationship in nature to appear first symbiotic when in fact it could become parasitic?

Identifying and Interpreting Effects of Change

The following graphic organizer will be used by cooperative groups to identify and log one physical change prompted by Belford vs. New Haven and a possible effect this would have in Edgewood Park.

(image available in print form)

The students will be encouraged to show the multiplicity of change by extending their organizer outward, parallel and horizontally as needed. Each group will be required to create a dual image of Edgewood Park. One side will represent the park prior to the proposed change, the other, after the proposed change. The graphic organizer will be matted onto the back of the image.

The Mural

An aerial view mural of Edgewood Park will be created on one wall in our science lab using a grid system superimposed on an aerial photograph, similar to the 1834 US map located on UCONN's Magic web site. Students identify the specific block they wish to reproduce from the aerial photograph. Using a metric ruler, they will block out patterns of lines and color from their section of the aerial photograph on graph paper prior to painting it on their block of the mural. Using a piece of chalk the lines and colors are marked on the wall. Once completed acrylic paint can be mixed and applied to the wall. The graphic organizers will be hung above the mural with a string zooming into the location of the proposed change. If the proposed change viewed as having multiple effects, then that many strings must zoom into the park. Each new change will add a barrage of string, with the goal of exemplifying the impact one physical change can have on its environment and why we must be very careful and thoughtful when making such decisions.

Edgewood Park Scientifically: Building The West River

Building Vocabulary: Defining Scientific Vocabulary

We will spend five classes building table top river models and conducting controlled experiments as outlined in River Cutters (18) from the Lawrence Hall of Science. These sessions will help the students gain an understanding of key river and river related language: aquifer, bed load, delta, dendrite, drainage basin, drainage pattern, eddy, erosion, floodplain, gully, lake, landslide, levee, meander, mouth, plunge pool, pothole, rapids, river, riverbank, riverbed, sandbar, sediment, source, spring, stream capture, tributary, valley, v-shaped valley, waterfall, watershed and water table. This is accomplished through the following sessions: exploring a table top river model, discussing river features, time and the river, dams and toxic waste, results of the river model, and age and slope. The GEMS guides produced by the Lawrence of Hall of Science at the University of California at Berkley are accurate and aligned to the National Science Standards. The experiments and language development is essential prior to the construction of a scaled model of local river systems.

The West River

The student generated mural, aerial photographs of Edgewood Park and site visits will be used to create a scale model of the West River. A 1 foot to 1 inch scaled down version of the river will be built in our science lab from MDO Plywood. MDO has a plastic overlay that makes it water proof and easy to cut. It is typically used for the construction of boats and must be purchased in a "true" lumber yard, not a home improvement center. Any imperfections in the fit of the plywood pieces can be corrected with bathroom caulking. SAFETY WARNING: MDO plywood should be cut wearing safety glasses and a dust mask. Students should be given precut sections of the plywood based on their design specifications (see appendixes A-C).

The width and depth of the river section chosen , as well as an equal embankment and riverbed ratios must be established during the design and construction process to produce accurate erosion and land sculpting experiments.

Collecting Data

Edgewood students will both walk and ride the river over a two day period. The New haven River Keeper, Peter Davis, will assist with the organization of water canoeing. During each session the students will photograph, sketch and script the river, logging areas of particular interest. The photographers will also be responsible for capturing images at regular intervals along the river. This data will be the basis of selection of the river section we build.

The photographs, sketches and script will be posted on a wall in the classroom in order of location on the river. This will allow viewing during the selection process. The students will use the following criteria for selection :

- 1.The model can be no longer than 10 feet or 100 feet of river with a 1 inch to 1 foot ' conversion ratio.
- 2.The section of river must be easily accessible for data and measurement collection.

3.The section should have diverse river features.

The section of the West River selected will be measured at 1 foot intervals. Measurements will include: depth, width and contouring. River bed features and 3 feet of embankment features will be logged for reproduction in our science lab. All materials used in the reproduction will come directly from the West River. Prior to this unit river plants will be grown in our grow lab for use during the West River Reproduction.

Rate of Flow on Erosion and Land Sculpting

Controlling rate of flow will allow the students the opportunity to explore river changes that have occurred over long periods of time. It will also encourage them to formulate hypotheses of future changes. The ability to not only investigate past river activity, but to apply this information to the future will instill in each of the students the power to understand and perhaps effect change in our communities.

Students will reproduce detailed embankment contours, features and plant life maps on graph paper. These maps will ensure that each experiment is approximately of equal values. Since all the variables in an experiment could never be controlled in a science lab, it is essential that the students understand the value and limitations of approximation. Little in science is exact. The best that can attained is a good approximation. The maps will be used by cooperative groups to conduct our experiments.

Our water source will be a 15 gallon plastic water tank with spicket, which are easily purchased at home improvement stores. Each group will log the rate of erosion and unique land sculpting that occurs at a specific rate of water flow. Their data collection chart will include water usage per 30 seconds; time elapsed to exhaust the 15 gallon water supply; amount of soil and or debris in the catch basin and pre-embankment and post-embankment measurements.

Each cooperative group will research local precipitation history and the impact this has had on the West River. While researching at the National Climate Data Center (19) website each group will be required to produce three graphs. The first graph will have the smallest data set. Each ensuing graph will have progressively larger data sets. The students will have to make predictions as to the patterns they believe will occur based on each graph. As the data set increases so will the excitement and frustration level of the class. The ability to understand the limited amount of information we truly have in society is critical to scientific research and discussions.

The Natural Diversity Data Base (NDDDB) website (20) will allow students to access information on significant natural communities in New Haven. They will use the website to research at least one animal and one plant species that are indigenous to the West River, and the impact changes in the river has on their environment.

Precipitation and local biodiversity data in conjunction with our rate of flow experiments, will be the basis of discussions led by each group in debriefing sessions. The students will apply their research and experiment to local biodiversity. At this point they will decide if further experimentation is needed to support their views or if they wish to move on to independent research topics.

Research Tools

The National Climate Data Center allows access to global and monthly U.S. digital precipitation data, through 1997, for all cooperative and NWS stations. It has some documentation that reaches back as far as 1804. This site has the capability to create graphs to the users specification; therefore making it an indispensable tool for students. Each graph is accompanied by a data set used in its design. Although they will only be required to produce three graphs on local precipitation, the students will be encouraged to explore national and global capabilities during the selection of research topics.

The Natural Diversity Data Base (NDDDB) is Connecticut's central repository for information on the biology, population status and threats to the elements of natural diversity. Students can access research on; Connecticut's Butterfly Atlas, endangered, threatened and special concern species in Connecticut, mapping for municipalities project, endangered species, and whip-poor-will and nighthawk surveys. The Natural Diversity Data Base is part of the Environmental and Geographic Information Center, a division of the Connecticut Department of Environmental Protection. (21)

The Exhibit: Choice of a Research Topic

Once the students have investigated change over time, open space in urban areas, political terminology, effects of change in respect to Edgewood Park, and have reproduced the West River, they are ready to conduct independent work.

Students will be required at this time to choose an exhibit category:

- Publications: children's literature, historical fiction, poetry or playwriting.
- Film/Photography: a slide/photography presentation, or original film.
- Two Dimensional Art: botanical drawing, painting or political cartooning.
- Three Dimensional Art: sculpture

and audience:

- Peers
- Adults (non-scientists)
- Adults (scientists)
- Young Children

Students will submit a research proposal to include the mode of exhibition, audience, experiment and their initial narrative response to the question: What is an honorable relationship with nature?

Each proposal will be reviewed by the teacher and accepted, or returned for revisions. After acceptance, a conference is scheduled between the student and I to discuss the project in greater detail. Students will be required to assist in the formation of a time schedule and establishment of rubrics for grading. A graphic organizer, outlining use of the library media center, classroom computers, lab equipment, video equipment, and construction tools will be posted by each student after their teacher conference. Two weeks of classroom time will be allotted for research, experimentation and exhibit construction.

Once the exhibit ends the audience will gather for a debriefing session with the researchers. This will allow Edgewood Speaks to end with meaningful dialog just as it began. The students are now the facilitators and I will be another member of the audience.

End Notes

1. Based on the article, An Environmentalist on a Different Path: A Fresh View on the Supposed Wilderness and Even the Indians., NY Times Arts and Ideas, Saturday, April 3, 1999.
2. Berk, Laura E., Vygotsky & Early Childhood Education., National Association for the Education of Young Children, Washington, DC, 1995.
3. The New Haven Science Content Standards were published in 1999 and are available at the Board of Education at 54 Meadow Street in New Haven, CT, 06515.
4. Citizens Park Council of Greater New Haven., New Haven Outdoors: a guide to the city's parks, Field graphics, Inc., New Haven, CT, 1977, page p.13.
5. The New Haven Park and Recreation Department has received funding to renovate Edgewood Park during the 1999-2000 year. The sun dial will be revived and a water scape added for educational purposes.
6. From Duyckinck, Evert A., Encyclopedia of American Literature, New York: C. Scribner, 1856, page 347.
7. Citizens Park Council of Greater New Haven., New Haven Outdoors: a guide to the city's parks., Field graphics, Inc., New Haven, CT, 1977, pages 30 and 31.
8. The Connecticut Newspaper Project <http://www.cslib.org/cnp.htm>
9. The New Haven Colonial Historical Society is located at 114 Whitney Avenue in new Haven, CT. Call for times and appointments 203-562-4138.
10. Belford vs New Haven, Brief Notes: 170 Conn. 46 are housed at the State Law Library at Church Street in New Haven, CT, page 48. 11. IBID 12. IBID, page 49. 13. IBID, page 49. 14. IBID, page 49. 15. IBID, page 49. 16. IBID, page 49. 17. IBID, page 49.
18. River Cutters published by the Lawrence Hall of Science, The University of California at Berkeley. 19. National Climate Data Center website located <http://www.ncdc.noaa.gov/ol/climate/online/coop-precip.html> 20. Natural Diversity Data Base website located <http://www.dep.state.ct.us/cgnhs/nddb/nddb2.htm> 21. IBID Instructional Materials Buz by iomega Multimedia Producer for Windows 95 allows students to capture, edit and share video, digital photos and sound using a computer that is equipped with Windows 95. Students can produce professional quality video for output to ZIP, JAZ, VCR tape or the internet. Exploring the Nardoo: An Imaginary Inland River Environment to Investigate, Maintain and Improve Interactive CD-ROM Interactive Multimedia Pty Ltd., 1996, Macintosh and Windows Compatible Designed for 6th - 10th grade audiences, it simulates the birth and evolution of an inland river catchment. It investigates four physical regions and four time periods. National Aerial Photography Program (NAPP) 1-800-USA-MAPS NAPP produces aerial photographs of your regions. Simply identify the area

on a map and submit it to them for processing. If local organizations do not make aerial photographs available this is an excellent source.

Internet Research Tools

About CT! <http://www.state.CT.us/about.htm>

Information and links from CT tourism to government agencies and statistics. A wealth of information and links for statistical information. Their search engine will access environmental articles relevant to the state of CT.

The Connecticut Newspaper Project is part of the nationwide United States Newspaper Program. CNP shares two goals with all state projects: first, to locate, catalog and inventory all American newspapers held in libraries, historical societies and other repositories in the state, and second, to preserve and increase access to American newspapers by microfilming as many of their state newspapers as possible. The Project is funded primarily by a grant from the National Endowment for the Humanities (as written by the Newspaper Project). <http://www.cslib.org/cnp.htm>

Envirofacts Homepage http://www.epa.gov/enviro/lojs_index.html

Interesting facts and data useful for student research.

Geolimages <http://www-Geolimages.berkeley.edu/Geolimages.html>

Photographs of land forms for teacher use. High resolution and quality. MAGIC:Scanned <http://magic.lib.uconn>.

Historical Maps

Historical US maps.

National Climate Data Center <http://www.ncdc.noaa.gov/ol/climate/online/coop-precip.html>

The Natural Diversity Data Base (NDDDB) is the central repository for information on the biology, population status and threats to the elements of natural diversity in the state of Connecticut. Information on rare plant and animal species and significant natural communities is compiled, stored and made available through the Data Base. The Natural Diversity Data Base, established in 1983, is part of the Environmental and Geographic Information Center, Connecticut Department of Environmental Protection (as written by the NCDC).

Natural Diversity Data Base

<http://www.dep.state.ct.us/cgnhs/nddb/nddb2.htm>

The Natural Diversity Data Base (NDDDB) is the central repository for information on the biology, population status and threats to the elements of natural diversity in the state of Connecticut. Information on rare plant and animal species and significant natural communities is compiled, stored and made available through the Data Base (as written by the NDDDB).

Project Wet

<http://www.rwwtetmsu.oscs.montana.edu>

Water education for teachers by teachers. Project Wet cross references its K-12 water education curriculum activity guide by topics, subjects areas, time requirements, grade levels, settings and teaching methods. The book can not be purchased. It is given to all participants after a one day Project Wet training session.

Student Bibliography

Costa-Pau, Rosa ., Soriano, Elvira., Segu, Jordi., Protecting Our Rivers and Lakes (The Junior Library of Ecology), Chelsea House Publications; ISBN: 079102105X , 1994.

Information about the effects of and solutions to pollution and the mismanagement of resources .

Grades: 4th-8th

Greenaway, Frank., Taylor, Barbara., Look Closer: River Life , Dk Pub Merchandise; ISBN: 0789434784 , 1998.

Examines, in text and photographs, the animals and plants that live in and along a river.

Grades: 4th-8th

Hester, Nigel., The Living River (Watching Nature Series) , Franklin Watts, Incorporated; ISBN: 0531141217, 1991.

Examines the network that exists between plants, fish, insects, and other animals that cohabit rivers.

Grades: 4th-8th

Sayre, April Pulley., River and Stream (Exploring Earth's Biomes), Twenty First Century Books; ISBN: 0805040889, 1996.

Describes aquatic biomes, focusing on life in rivers and streams, and explains the effect of pollution on these biotic communities and on the lives of people everywhere

Grades: 4th-8th

Taylor, Barbara ., Haslam, Andrew., Rivers, World Publications; ISBN: 071661751X, 1996.

Describes the geography of rivers including their power to erode and form deltas and the formation of waterfalls, rapids, and canyons. Includes experiments and other activities.

Young Adult

Tesar, Jenny E., America's Top 10 Rivers (America's Top 10) , Blackbirch Marketing; ISBN: 1567111890.

Two pages of information on each of the mountains or rivers examined. Includes full-page color photographs and map insets, some photos are grainy. The text is basic and includes several useful Internet addresses are included. Grades: 4th-8th

Teacher Bibliography

Bell, Michael. The Face of Connecticut : People, Geology, and the Land Department of Environmental Protection Maps and Publications, 1985.

Geologic processes and human history of Connecticut combined. Citizens Park Council of Greater New Haven., New Haven Outdoors: a guide to the city's parks., Field graphics, Inc., New Haven, CT, 1977. Esposito, Nancy M., Classroom Ecosystems: Windows on our Environment, Yale New Haven Teachers Institute, New Haven, CT, 1992.

This curriculum unit assists ecosystems the in educator in educational establishing settings. and maintaining

Kinder,Carolyn., The Geology of the West River, Yale New Haven Teachers Institute, New Haven, CT, 1984.

Ms. Kinder's curriculum unit is a concise geological overview of the West River.

Kutz, Christopher., Democracy in New Haven: A History of the Board of Aldermen 1638-1988.,Office of Legal Services, 1988.

Political and historical perspective of the power struggles that have shaped and defined New Haven, CT.

Lowery, Lawrence F., NSTA Pathways to the Science Standards: Elementary Edition., National Academy Press, Washington, D.C., 1997.

Guidelines for moving the content and philosophy of the National Science Standards forward.

Milbrath, Lester W., Learning to Think Environmentally: While there Is Still Time., State University Of New York Press, Albany, NY, 1996.

Environmental conversations between two neighbors plainly written. The ethical and environmental concerns are presented in clear, easily understandable text.

New Haven Public Schools., Academic Performance Standards., New Haven Public Schools, New Haven, CT, 1999.

The New Haven performance standards are aligned with the state and National Science Standards. This document is presented by grade level kindergarten through twelve grade.

An Environmentalist on a Different Path: A Fresh View on the Supposed Wilderness and Even the Indians., NY Times Arts and Ideas, Saturday, April 3,1999.

William Cronon, a professor in environmental history at the Universityof Wisconsin challenges our concept of wilderness.

National Science Resources Center., Resources for Teaching Elementary School Science., National Academy of Sciences-Smithsonian Institution, National Academy Press, Washington, D.C., 1988. Patent, Dorothy Hinshaw., Biodiversity., Hoght Mifflin Co., NY, NY, 1996.

Ms. Patent takes an increasingly large subject and focuses it primarily on North America and Costa Rica.

Rapp, Valerie., What the River Reveals : Understanding and Restoring Healthy Watersheds , Mountaineers Books; ISBN: 0898865271, 1997.

A good book to begin understanding the interactions between rivers, watersheds and the environment.

Roberts, David C., Geology: Eastern North America., Hought Mifflin Co., Boston, NY, 1996.

A Peterson Field Guide Shemway, Floyd., Hegel, Richard., New Haven An Illustrated History, Windsor Publications Inc., Woodland Hills, CA, 1981.

Collection of images tracing the history of New Haven.

Stalker, Geoffrey., The Visual Dictionary of the Earth., DK Publishing, Inc., NY, NY, 1993.

An excellent tool for visual learners.

Purseglove, J., Wait, G. A. and Haslam, Sylvia., The River Scene : Ecology and Cultural Heritage , Cambridge University Press; ISBN: 0521574102, 1997.

The book presents an overview of river ecology, looking first at the natural environment - river structure, inhabitants, classification and pollution or other damage. This is followed by a discussion of the cultural environment, the importance of which is often overlooked: the history, archaeology, and social and legal contexts of rivers.

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