



Middle School Pathway at ENC

enc.nsdl.org

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Middle School Pathway Goals

- Create an entry point into the NSDL collections to help middle school mathematics, science, and technology teachers find high-quality, grade-appropriate resources for instruction and professional development
- Reach a targeted audience of middle school educators by building on the technology and metadata infrastructure created by Core Integration for the larger NSDL

Middle School Pathway Accomplishments

- Demonstrated the capacity to harvest, augment, and display item-level metadata from the NSDL Metadata Repository (MR)
- Created three online publications that place NSDL resources in a standards-based context for middle school teachers
- Developed prototype full-text resource searches by state and national standards

Metadata Harvesting

- Identified 21 NSDL-funded collections that have appropriate middle school item-level metadata in the NSDL Metadata Repository (MR)
- Contacted PIs on 21 harvested collections
- Filtered records from some collections for those most appropriate for middle school
- Initially harvested metadata for more than 30,000 resources

Metadata Harvesting

Technical Information

- MSP metadata is extracted from the MR using the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH, or just OAI)
- The driver software for this process is REAP, developed at University of Illinois at Urbana-Champaign
- MSP is coded in PERL (harvesting) and ASP.NET (database and web site) and uses MS SQL Server 2000 for the database

Record Selection Flow

Collections in NSDL MR




Metadata Augmenting

- Developed database to house and process harvested metadata records
- Reviewed harvested metadata catalog records to identify high-quality, standards-based resources
- Added necessary metadata for grade level, learning resource type, and subjects based on MSP Best Practices document
- Initially selected 350 NSDL resources for subject-specific browse lists


Metadata Augmenting

- MSP staff is working on the development of a commonly accepted controlled vocabulary for the Learning Resource Type field
- MSP staff is building on ENC work to develop mathematics and science subject lists useful for K-12 education


Imported Metadata

 <p>THE NATIONAL SCIENCE DIGITAL LIBRARY</p> <p>Imported Metadata</p> <p>ENC Metadata</p> <p>Technology Subjects</p> <p>Math Subjects</p> <p>Science Subjects</p> <p>Instructional Issues</p>	<p>View MSP Metadata 190015322: Biodiversity Counts Collection: Internet Scout Project</p>	
	dc:title:	Biodiversity Counts
	dc:subject:	Life sciences
		Biological diversity
		Life sciences -- Study and teaching
		Life sciences -- Study and teaching -- Activity programs.
		Biological diversity -- Study and teaching
	dc:description:	Biological diversity -- Study and teaching -- Activity programs.
		This extensive collection of activities from the American Museum of Natural History offers middle school students "an exciting and creative context for involving students in the scientific process while introducing them to the rich diversity and beauty of their local ecosystem." Lesson plans, Web-based interactive activities, useful Web links, profiles of AMNH scientists and staff, and other features help students inventory and analyze the plants and arthropods found in their own neighborhoods. All activities address national science standards, and have been "field tested" in schools around the nation. Biodiversity Counts even has students develop their own exhibitions for their findings -- a great way to build science communication skills.
	dc:publisher:	American Museum of Natural History.
dc:date:	1998-	
dct:dateSubmitted:	2003-02-21	
dc:identifier:	http://www.amnh.org/education/resources/biocounts/index.php	
dc:language:	en	
dct:isPartOf:	http://scout.wisc.edu/nsdl-reports/life-sci/2003/lis-030221-education.html#1	

ENC Metadata Augmenting Subjects

 <p>Imported Metadata</p> <p>ENC Metadata</p> <p>Technology Subjects</p> <p>Math Subjects</p> <p>Edit Science Subjects</p> <p>Instructional Issues</p>	<h2>Science Subject Terms</h2> <p>190015322: Biodiversity Counts Collection: Internet Scout Project</p> <hr/> <h3>MSP Subjects</h3> <p>Life Science</p> <ul style="list-style-type: none">Ecosystems<ul style="list-style-type: none">Biological interdependencePopulationsEvolution<ul style="list-style-type: none">DiversityScience as Inquiry<ul style="list-style-type: none">Science Processes<ul style="list-style-type: none">ClassificationData analysisData collectionObservation <hr/> <h3>Imported Subjects</h3> <p>Life sciences Biological diversity Life sciences -- Study and teaching Life sciences -- Study and teaching -- Activity programs. Biological diversity -- Study and teaching Biological diversity -- Study and teaching -- Activity programs.</p>
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ENC Metadata Augmenting Learning Resource Type and Grade Level

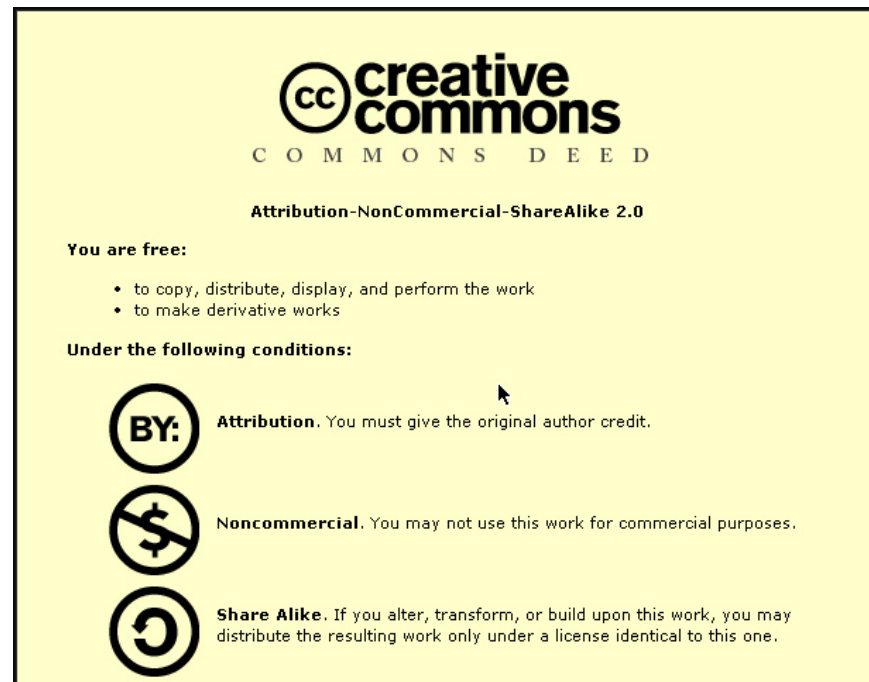
 Imported Metadata ENC Metadata Technology Subjects Math Subjects Science Subjects Instructional Issues	MSP Metadata 190015322: Biodiversity Counts Collection: Internet Scout Project	
	Learning Resource Type:	Instructor Guide Project
	Grade Level:	6 7 8 9 10 Teacher
	Notes:	

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- User-centered design based on middle school teacher focus group input
- Subject-specific browse lists feature augmented catalog records for resources that are standards-based and appropriate for middle school instruction or teacher professional growth
- Online publications highlight selected catalog records with augmented metadata addressing hard-to-teach topics: measurement, plate tectonics, and prototype development

Reusability

- Reusability Guidelines informed designs for the MSP site www.reusablelearning.org
- Creative Commons license in place




Live Record

NSDL Middle School Portal

Home | Math | **Science** | Technology | Contact

Science > Surf Your Watershed

 **Surf Your Watershed**

URL: <http://www.epa.gov/surf/>

Abstract: Surf Your Watershed is a service to help you locate, use, and share environmental information about your state and watershed. There are four components to the site. Clickable maps, zipcode look-ups and place name searches provide access to local watershed information. A searchable database offers information on the Adopt a Watershed campaign, a project that challenges citizens and organizations to work to protect valuable watersources through local and regional activities such as volunteer monitoring, cleanups and restoration projects. The Watershed Atlas is a catalog of geo-spatial displays and analyses of information and data important for watershed protection and restoration. You can use the catalog by geography, theme, key word, and source/organization or your own words. Finally, the Environmental Website database contains hundreds of URLs about environmental information.

Grade Level: 6 - 12

Learning

Resource Type: Data Set, Map, Reference

Subjects: Science / Earth and Space Science / Earth Materials
Science / Personal and social issues / Environments / Environmental quality
Science / Personal and social issues / Natural resources

Format: text/html

Contributors: Environmental Protection Agency(Publisher)

Language: en

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Homepage

NSDL Middle School Pathway at ENC

Home | Math | Science | Technology | News | About | Contact

ENC pathway to
**MEASUREMENT
SLICED AND DICED**

Math

- ▶ [Browse by subject](#)
- ▶ [Browse by standard](#)
- ▶ [My Math site](#)

ENC pathway to
**PLAYE
TECHNICS**
Moving Middle
School Science



Science

- ▶ [Browse by subject](#)
- ▶ [Browse by standard](#)
- ▶ [My Science site](#)

ENC pathway to
**PROTOTYPE
Development**
Try, Try Again...

Technology

- ▶ [Browse by subject](#)
- ▶ [Browse by standard](#)
- ▶ [My Technology site](#)

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Online Publication

The screenshot shows a web page with a dark blue header containing the NSDL logo and navigation links: Home, Math, Science, Technology, News, Partners, About, and Contact. A search bar is located in the top right corner. Below the header is a red banner with the word 'Technology'. The main content area features a large graphic with the text 'PROTOTYPE Development' and 'Try, Try Again...' over a background of technical drawings and a satellite. To the right of the graphic is a table of contents with links for Introduction, Background Information, Lessons and Activities, Projects, and International Technology Education Association Standards. At the bottom of the page, there is a red bar with the word 'Introduction' and print options: 'PRINT THIS SECTION' and 'PRINT ALL SECTIONS'.

Prototype Development: Try, Try Again SEARCH

Home | Math | Science | **Technology** | News | Partners | About | Contact

Technology

Prototype Development: Try, Try Again EMAIL THE EDITOR




Contents

- Introduction**
- [Background Information](#)
- [Lessons and Activities](#)
- [Projects](#)
- [International Technology Education Association Standards](#)

Introduction PRINT THIS SECTION | PRINT ALL SECTIONS

How do engineers move from imagination to reality with a new product? It's a long process with many complex steps. Eventually engineers end up with models. Product design models make for flashy presentations. But the ability to create a tangible working model--a prototype--from the design is what allows the proper evaluation of a product. Engineers use prototypes to generate data that help perfect the final product. Usually it takes more than one try to get it right. This step of the product design

Browse List Return

NSDL Middle School Portal	
Home	Math Science Technology Contact
Math by subject	Browse by standards
Problem Solving Strategies	
 <p>View Full Record</p>	<p>Title: Thirteen? Oh, no! : Are you superstitious? Do you avoid the number 13?</p> <p>URL: http://www.figurethis.org/challenges/c13/challenge.htm</p> <p>Description: This activity asks student to determine if there a Friday the 13th in every year. The activity, from the Figure This! collection of 80 math challenges, also considers superstitions associated with the number 13. It suggests that the student make lists and examine calendars to determine the total number of possible calendar arrangements. The usefulness of reasoning with number patterns and dates is noted. The page features links to a solution hint, the solution, related math questions, and resources for researching other questions related to calendars and dates. Copyright 2003 Eisenhower National Clearinghouse (ENC).</p> <p>Grade Level: 6 - 8</p> <p>Resource(Type): Lesson or Activity</p>
 <p>View Full Record</p>	<p>Title: What Color Hat am I Wearing?</p> <p>URL: http://mathforum.org/library/drmath/view/55638.html</p> <p>Description: Three students close their eyes, and the teacher puts a hat on each of their heads (hiding the other two hats)...</p> <p>Grade Level: 6 - 10</p> <p>Resource(Type): Article</p>
 <p>View Full Record</p>	<p>Title: Who Gets the Job?</p> <p>URL: http://mathforum.org/library/drmath/view/55704.html</p> <p>Description: Each job candidate can see the other two candidates' black or red dots but not his own. Whoever can figure out the color of his own dot gets the job.</p> <p>Grade Level: 6 - 10</p> <p>Resource(Type): Article</p>

Benefits to NSDL Collections

Building on work done by the collections, MSP contextualizes existing records for a middle school mathematics, science, and technology audience. We...

- Augment original metadata
- Present augmented records in subject-specific browse lists
- Package records into online publications
- Include logos of the originating collections

MSP Future Plans

- Regularly **reharvest** the MR to update item-level metadata
- Identify and harvest **additional collections**
- Make available **searches by state and national standards**
- Develop **new online publications**
- Make augmented **metadata available** for harvest by the NSDL MR