INTEGRATING STEM & MWEE

A multi-disciplinary approach to teaching project-based environmental education

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Our Location
Arlington County is a diverse community located across the Potomac River from Washington, D.C.
13th largest among Virginia’s 132 school
A total of 39 schools and programs
Serving over 28,000 students
Strategic plan core values focus on environmental sustainability and stewardship
University of Virginia’s Blandy Experimental Farm & The State Arboretum of Virginia

Our Mission: “To advance understanding of the natural world through education, outreach, and research.”

Role as project partner:
- MWEE expertise
- Project conception
- Project administration
- Initial curriculum development
- Field site
- Create & manage a public web site
What is STEM?

- **Science**
- **Technology**
- **Engineering**
- **Mathematics**
What is Project-Based Learning?

- Project Based Learning engages students with hands-on investigations based on an authentic problem to gain knowledge and skills.
What is a MWEE?

- Meaningful
- Watershed
- Educational
- Experience

Outdoor Field Based Experience

Action

Synthesis & Conclusions
<table>
<thead>
<tr>
<th>PBL</th>
<th>MWEE</th>
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<tbody>
<tr>
<td>Define a problem</td>
<td>Issue based; propose a question</td>
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<tr>
<td>Student centered</td>
<td>Student centered</td>
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<tr>
<td>Multiple step investigation</td>
<td>Classroom &amp; outdoor investigations</td>
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<tr>
<td>Compose &amp; test solutions</td>
<td>Collect data to answer a question</td>
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<tr>
<td>Multidisciplinary</td>
<td>Multidisciplinary</td>
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<tr>
<td>Analyze &amp; synthesize results</td>
<td>Analyze &amp; evaluate results</td>
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<tr>
<td>Communicate results</td>
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<tr>
<td>Project-focused</td>
<td>Action Project</td>
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What are the essential elements of a PBL & MWEE?
Benefits of Partnerships
Partnership Ideas

- Parent and Community Expertise
- Local, state, federal agencies
- Businesses
- College and Universities
- Nonprofits
Effective MWEE Partnerships

preK-12 Educators + Environmental Educators

Effective Outcomes
Knowledge, Skills & Understanding
Curriculum Design
Instructional Strategies
Relevance & Rigor
Indoor & Outdoor Learning
Erosion & Sediment: Watershed Impacts & Mitigation

Explore: What are some causes of erosion & sedimentation?

Design & test: How can we reduce sedimentation?

Oysters: What are some impacts of sedimentation?
Elementary students reducing litter impact in the watershed

https://www.apsva.us/aps-green-scene/
Exploring land use history: Past uses influence present & future uses
Year-Long Stream Monitoring
Action Projects: Community & Civic Engagement

Parents:
Take The Watershed Pledge:
1. Reduce the rate and volume of runoff from your property.
2. Reduce your overall water usage.
3. Make choices that improve the quality of water running off your property.

Student Voice/
Student Advocacy
Assessment
Next Steps:

Brainstorm MWEE ideas, including the following:

- What are some environmental issues where you live and work?
- Who are the potential stakeholders and partners?
- What are potential funding sources?
- What is the project plan, including the environmental focus and targeted audiences?
MWEE Think Cloud

What are the objectives for learning?

Your MWEE idea:

What are the local issues, problems, or phenomena to explore?

What field trips, outdoor assets, or other resources exist at my school?

Who can I work with on this project?

What else do I need to consider?
The MWEE Guide

A tool to connect field & school-based educators in the service of designing & implementing MWEEs.
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