Welcome to: Bring Michigan Science Standards to Life Using Place-based Education

How would you describe place-based education?

Add a sticky note to the poster with 2-3 words describing place-based education.
Bring Michigan Science Standards to Life Using Place-based Education

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What is Place-Based Education?

“What Place-Based Education is a teaching and learning practice and philosophy that relies on place – including lands and waters, people and organizations, history, and culture – as a starting point for teaching and learning.”

- Great Lakes Stewardship Initiative
Place-Based Education is...

- Cross-curricular
- Interdisciplinary
- Hands-on
- Inquiry-based
- Student-driven
- Focused on the community
- Collaborative
- Contextually embedded
- Stewardship-oriented
Benefits to the Community

Place-based Education is a “community-supported approach to teaching and learning that occurs in and with a place or community, is about a place or community, and yields benefits for a place or community.”

- Great Lakes Stewardship Initiative

- Establishes new collaborations
- Progress toward common goals and initiatives
- Civic engagement and development of informed citizens
- Investment in communities
- Opportunity for businesses and government to engage with students
Benefits to Students

- Content learning is relevant
- Real-world applications for learning
- Development of critical thinking skills
- Exposure to various careers
- Opportunities to engage with the public
- Develops a sense of place
- Positively impacts the communities they live in
Benefits to Teachers

- Students are engaged with the content
- Aligns with state content standards
- Promotes teaching best practices
- Opportunity to give back to the community
- Connects the community to the classroom
- Engages parents, students, and community in accomplishing a common goal
- Provides leadership opportunities
- Stands out on performance evaluations
Groundswell Initiative

Groundswell is an environmental place-based education initiative housed in the Grand Valley State University College of Education that supports teachers in providing quality place-based education experiences for students.
Groundswell Initiative

- Funding place-based projects tied to curriculum standards
- Providing professional development
- Fostering community connections and partnerships
Process - What does standards based place-based education look like?

- Students identify problem based on criteria and constraints in the community
- Using problem solving and critical thinking, students design and develop solutions to those problems
- Students implement the solution to the problem
- Students publically present their results
Students identify problem based on criteria and constraints in the community

- **Criteria** are things the design needs to do in order to be successful—its requirements.
- **Constraints** are limitations on the design.

Source: https://wgvu.pbslearningmedia.org/resource/criteria-constraints/identify-criteria-and-constraints-engineering-for-good/
Next Generation Science Standards

- Grades K-2- Engineering design in the earliest grades introduces students to “problems” as situations that people want to change. Emphasis is on thinking through the needs or goals that need to be met, and which solutions best meet those needs and goals.

- Grades 3-5 At the upper elementary grades, students define a problem using criteria for success and constraints or limits of possible solutions. Students research and consider multiple possible solutions to a given problem.

- Grades 6-8 At the middle school level, students learn to sharpen the focus of problems by precisely specifying criteria and constraints of successful solutions, taking into account the larger context within which the problem is defined, including limits to possible solutions.

- Grades 9-12 Engineering design at the high school level engages students in complex problems that include issues of social and global significance. Students quantify criteria and constraints.

[https://www.nextgenscience.org/sites/default/files/Appendix%20Engineering%20Design%20in%20NGSS%20FINAL_V2.pdf](https://www.nextgenscience.org/sites/default/files/Appendix%20Engineering%20Design%20in%20NGSS%20FINAL_V2.pdf)
Criteria and Constraints in Your Place

- Local Project Problem Example: The Sparta community was largely uninformed about Nash Creek and the role we have in the watershed we live in. The stream banks of Nash Creek were eroding leading to poor water quality and there were large amounts of invasive plants resulting in decreased habitats for wildlife.

- What are some of the criteria and constraints that the students needed to consider when identifying their local problem?

Criteria are things the design needs to do in order to be successful--its requirements.

Constraints are limitations on the design.

Source: https://wgvu.pbslearningmedia.org/resource/criteria-constraints/identify-criteria-and-constraints-engineering-for-good/
Using problem solving and critical thinking students design and develop solutions to those problems

Steps to Guide Students

1. Identify and Define the Problem
   - Develop a problem statement. Include an evaluation of the present state and how it differs from the goal state. Be sure you have evidence to support your views.

   What could this step look like for the Nash Creek Project?

2. Analyze the Problem
   - Learn as much as you can about the problem. Seek other perspectives (ask questions!), and get help if you lack sufficient information.

   Community partners can be a great resource for this step.
3. Identify Possible Solutions
   • Come up with as many solutions as possible, including ones for similar problems in the past.
   Solutions for the Nash Creek example?

4. Select the Best Solutions

5. Evaluate the Best Solutions
   • Are the solutions practical? Exactly how and when could you implement them?
   • Do the solutions address the root cause of the problem?
   How does this step fit into the standards?

6. Develop an Action Plan
   • Divide the solutions into sequential tasks that you can later implement.
   Do you think this would be a single year project or multiyear project?
Students implement the solution to the problem

During the 2016-2017 school year in Sparta schools:

• **525** 3rd, 4th, and 5th grade students
• **2000** native plants
• **3** community partners and township support
• **15** Next Gen Science Standards met
Students publically present their results

• Student Showcase at Celebration Cinema

• Sparta students helped with community wildflower tours, presented at township and village board meetings, and were featured in their local newspaper.
  
http://groundswellmi.org/schools/sparta-area-schools/
Place-Based Education in Action

City High Middle School
http://groundswellmi.org/schools/city-high-middle-school/

Pinewood Middle School
http://groundswellmi.org/schools/pinewood-middle-school/

Pinewood Elementary School
http://groundswellmi.org/schools/pinewood-elementary-school/
Questions?
Groundswell partnered with WGVU and the GVSU Annis Water Resources Institute to create a series of educational videos and lesson plans about nonpoint source pollution.

Lesson One: What is a Watershed?
Lesson Two: Managing Excess Sediment
Lesson Three: Managing Pathogens
Lesson Four: Managing Excess Nutrients

The Communities for Clean Water videos and lesson plans were made possible through a grant from the U.S. Environmental Protection Agency through the Michigan Department of Environmental Quality.
Contact Us

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