

3-P Learning in Michigan

The Michigan policy environment for STEM education offers significant advantages, yet historically, curricula and instructional resources have been fragmented. **The MiSTEM Network seeks to unify key industries, communities and organizations to support STEM education through interdisciplinary teaching and learning within a coordinated and adaptable system.** This vision is built on four pillars: create a STEM culture, empower STEM teachers, integrate business and education and ensure high-quality STEM experiences.

The fourth pillar, high-quality STEM learning, focuses on “**3-P learning**,” which encompasses problem-, project- and place-based learning. These are student-centered approaches designed to engage learners through experiential learning. While problem- and project-based learning are often used together, they are distinct pedagogical approaches.



Problem-Based Learning

In problem-based learning, students explore a subject by **solving an open-ended problem observed in a real-world phenomenon**. The end goal is to develop solutions to problems whether they are real or simulated by the teacher. Rather than centering the learning on a predetermined answer, problem-based learning encourages exploration and experimentation and the development of knowledge acquisition, enhanced group collaboration and communication (Reed, 2020).



Project-Based Learning

In contrast, project-based learning focuses on **creating tangible outcomes, such as a product, performance or event**. As the name suggests, students engage in real-world, sustained projects that typically involve interdisciplinary activities such as research, scientific exploration, writing and multimedia production. Research indicates that problem- and project-based learning has a positive impact on children’s dispositions toward science and STEM careers (Culclasure, Longest & Terry, 2019; LaForce, Noble & Blackwell, 2017).



Place-Based Learning

Place-based learning emphasizes **solving community problems**. This approach draws learning opportunities from the cultural, economic, environmental and geographical aspects of a particular community. Students employ anthropological and field-based methods to address community problems, immersing themselves in the location. Research indicates that place-based learning supports scientific engagement (Zimmerman et al., 2016), sustainability (Gray, 2023; Kates et al., 2001) and inclusive educational practices (Davison, Hunt & O’Flaherty, 2007).



Examples

Problem-Based Learning

Our water supply was compromised due to high flooding last year, which contaminated our local reservoir. To prevent recurrences in the future, should we redesign our reservoir? Should we devise a less expensive but more comprehensive system for filtering water? Which is more economical? How can we present these solutions to City Hall?

Project-Based Learning

There is a small, unused plot of land behind the middle school building. Let's devise a use for the land (eliciting suggestions from students), determine what's best (A mini playground? A picnic area? A garden? A small grove of trees? Something that you, the teacher, haven't thought of?), write letters to the stakeholders, apply for grants for materials, brainstorm sustainable ways to make our idea happen and actualize our vision.

Place-Based Learning

Students from East High School visit the Ecology Center at a nearby preserve to investigate algae blooms in a pond located there.

West Middle School students explored the (cultural, ethnic, demographic) diversity of the local community and, through interviews, collected stories of cultural belonging and class struggle in order to create a book, titled "Staying Power."

