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| Place-based Education Project/Unit Plan | | | | | | | | |
| **Name of Project/Unit: Huron River Water Filter Project** | | | | | | **Duration: 4-8 weeks** | | |
| **Primary Subject(s) Addressed: Ecology, Water Pollution, Engineering Cycle** | | | | | | **Grade Level: 9** | | |
| **Place/Community Site for Renewal: Riverside Park/Ypsilanti Community** | | | | | |  | | |
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| **Project Summary/Overview** | Students are given a challenge letter from the Huron River Watershed council about current issues facing the Huron River. The students are then to use the engineering cycle to design a water filter to mitigate the issues with the river. Students have the opportunity to go to Riverside park and with the help of the HRWC learned about stream erosion, turbidity, and benthic macroinvertebrates. Students are given a budget of $50 and a supply list with prices. They work in teams to build a water filter and test River water before and after it is filtered for changes in pH, mass, volume, and transmittance using a spectrophotometer. Students make iterations to their filters in order to improve its ability to clean the water. Students created posters to summarize their results and whichever team had the clearest water won a prize. | | | | | | | |
| **Common Core State Standards Addressed:** | **HS-LS2-7**: Design , evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity (Performance Expectation).  **LS4.D**: Biodiversity and Humans (Disciplinary Core Idea).  **Crosscutting Concepts**: Stability and Change  **Science and Engineering Practices**: Constructing Explanations and Designing Solutions  **HS-ETS1-2**: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering (Performance Expectation).  **HS-ETS1-3**: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts (Performance Expectation).  **ETS1.B**: Developing Possible Solutions (Disciplinary Core Idea).  **ETS1.C**: Optimizing the Design Solution (Disciplinary Core Idea). | | | | | | | |
| **21st Century Competencies** (to be taught) | *Collaboration and Communication* | X | | *Creativity and Innovation* | | | | X |
| *Collaborative Problem Solving* | X | | *Information and Communication Technology* | | | | X |
| *Critical Thinking* | X | | *Personal and Social Responsibility* | | | | X |
| **Top 5-10 Measureable Outcomes:** | By the end of the project/unit, students will be able to: | | | | | | | |
| **Driving/Essential Question** | How can we help to keep the Huron River clean? | | | | | | | |
| **Key Concepts/Big Ideas** | Engineering cycle, water pollution, ecosystems, building a model, collecting and analyzing data | | | | | | | |
| **Student Products/ Presentations/Civic Actions** | Students created the actual water filter, they also created posters to summarize their findings | | | | | | | |
| **Public Audiences** |  | | | | | | | |
| **Entry/Launch Event** | Students reading/analyzing challenge letter and the Riverside park field trip. | | | | | | | |
| **Reflection Methods/Formative Assessments:**  **(These are just examples)** | Journal/Learning Log | | X | | Chart and Chat | |  | |
| 4-Corners discussion | |  | | Norms reflection and debriefing | | X | |
| **Activities/Lessons:**  *What lessons will allow students to build the knowledge, skills, and habits to reach your outcomes, inquire deeply into the driving question and concepts, and publicly demonstrate their understanding for real audiences?* | | | | | | | | |
| **Community Partners:** *Who are your community partners? What are your next steps for helping students connect to existing and new partners?* | | | | | | | | |
| **Materials Needed:** | | | | | | | | |