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| Title | BPI Waterkeepers |
| Author | Bobby Marinelli, Maureen ONeill |
| School, District | Baltimore Polytechnic Institute, BCPSS |
| Audience (grade, course) | 12th Environmental Science & 11/12 Film Video |

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| Curriculum Anchor |
| Learning Objectives and Curriculum Connection  Curriculum indicators, performance expectations, and/or learning objectives. |

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| Students will:   * test water quality of the Lower Jones Falls C Water Station * collect water quality data * specific values to be monitored include pH, DO CO2, and nitrate levels * analyze the water quality data over time to identify trends * produce and use original film/video to share their efforts and results to advocate for local water quality awareness.   CCSS –  **6.4** The student will develop and apply knowledge and skills gained from an environmental issue investigation to an action project which protects and sustains the environment.  NGSS –   |  |  | | --- | --- | | HS-LS2-7. | Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. |  |  |  | | --- | --- | | HS-ESS3-4. | Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. |   Film/Video Project: AASL Standards for the 21st Century Learner  3.1.4Use technology and other information tools to organize and display knowledge and understanding in ways that others can view, use, and assess.  3.1.5 Connect learning to community issues.  3.3.3 Use knowledge and information skills and dispositions to engage in public conversation and debate around issues of common concern.  3.3.4 Create products that apply to authentic, real-world contexts.  3.3.5 Contribute to the exchange of ideas within and beyond the learning community.  3.3.6 Use information and knowledge in the service of democratic values. |

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| Driving Question  A broad, open-ended, life-relevant question that is based on the standards/learning objectives. Guides inquiry for the investigation(s), prompts the development of actionable claims. |

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| How can we use data collection and analysis tools to investigate and advocate to protect the water quality of Baltimore’s waterways feeding into the Chesapeake Bay?  C:\Users\mroneill\Downloads\dirty water.jpg |
| C:\Users\mroneill\Downloads\map.jpg |
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| Context  Establishes local connections and life-relevancy of the core ideas in the learning objective and driving question. |

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| Baltimore City has an aging infrastructure, especially in its water and sewage systems. Sewage regularly leaks into local waterways, affecting the lives of Baltimore Citizens. Not everyone is always aware of these dangerous water quality levels or what the different measures mean for human and environmental health, and that’s where the Blue Water Baltimore organization comes in. Local news investigations have revealed that while the government is required to alert citizens when the water quality has fallen, especially fecal coliform levels, this notification doesn’t always take place. Blue Water Baltimore’s Waterkeepers program aims to help advocate for greater awareness, accuracy in water quality testing, and transparency to communicate this with the general public.  Resources from local news on Baltimore water quality and the role of Blue Water Baltimore’s Waterkeepers program: <http://www.bluewaterbaltimore.org/blog/blue-water-baltimore-in-the-news-2016/> |

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| Issues Investigation |
| Asking Questions, Defining Issues and Problems  Students define the issue, problem, or phenomenon to be investigated and develop questions that are relevant for investigation. |

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| Why is water quality important to Baltimore citizens and especially to Poly students?  What is the quality of the local water in the Poly area?  What tools are used to measure local water quality?  What do the water quality trends indicate over time?  How can Poly students help advocate for better water quality in Baltimore?  While students in the Environmental Science course will use questions to investigate and analyze the water quality of the Lower Jones Falls C waterstation, students in the Film/Video course will use the process of creating a basic investigative journalism and documentary public service announcement to produce an original film/video. Using resources from the Right Question Institute, students will use the video production process to question and engage in inquiry as a means of learning active participation in a democracy and advocacy for the environment in their community.  According to the Right Question Institute, “A democracy needs citizens who can ask questions, participate in decisions and hold decision-makers accountable on any level of democracy. Indeed, we encourage people to “act democratically” by writing letters to the editor or to a representative, attending public hearings, organizing, advocating and voting.”  Resource: <http://rightquestion.org/microdemocracy/> |

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| Planning & Conducting Investigations  Students develop plans for collecting, analyzing, and communicating information and/or data to help them answer their questions and understand the problem. Students identify and justify appropriate sources of information and/or data, and determine methodologies for the collection of information and/or data. |

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| Students use water quality testing tools modelled after the BWB Waterkeepers program to visit the Lower Jones Falls C Station and track data on the following water quality parameters:   * Phycoerythrin * Chlorophyll a * Dissolved oxygen * Fecal bacteria * Temperature * Total Nitrogen * Total Phosphorus * Turbidity * Water Clarity * pH * Salinity * Conductivity   Students will use technology tools such as video cameras and video editing software to document the active fieldwork of the Environmental Science students as they collect water quality data. Film/video students will also conduct interviews with students, teachers, and representatives from local environmental agencies to better understand how to share their work as environmental advocates. |

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| Analyzing and Interpreting Data  Students represent and share information and/or data to reveal patterns that indicate relationships. Students apply disciplinary concepts as they analyze and interpret information and/or data to make sense of the issue or phenomenon. |

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| Students will collect and record the above water quality readings at regular intervals throughout the year. Students will analyze the data and identify trends. Students will interpret this analysis and share their findings as to why the findings are important for our local Poly community and the broader community in Baltimore and the Chesapeake Bay Watershed region. |

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| Constructing, Communicating, & Refining Explanations  Students identify and apply evidence from their investigations (for example, measurements, observations, and patterns) to construct, communicate, and refine explanations about the driving question. |

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| Film/Video students will produce video documentation of this data collection and edit the footage in order to share results as part of the advocacy and communication objectives. They will interview members of the greater Poly community, including its diverse stakeholders, to interpret the meaning of the data for our community. Students will share this video with Blue Water Baltimore and the Chesapeake Bay Foundation. |

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| Civic Engagement |
| Develop a Claim  Students develop and present a claim (a belief or opinion grounded in factual knowledge that is based on evidence from the analysis of data and constructed explanations from the issues investigation). |

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| Once students have produced their data based video documentary of their local water quality analysis, students will share their video with local advocacy and news organizations in order to open a broader conversation about the importance of water quality, its testing, and results. |

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| Design a Solution and Implement Action  Students assess their individual and collective capacities to take action to address the problem or issue of their claim. Students develop a plan to apply a range of deliberative procedures to take action in their classrooms, schools, and/or in out-of-school civic contexts. Student’s Civic Engagement plans should define the criteria for success of the action as a solution to the problem or issue. |

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| Students will read and discuss the article, “How Documentaries Have Become Stronger Advocacy Tools” by Vincent Stehle.  Source: The Chronicle of Philanthropy, October 2011  <https://www.philanthropy.com/article/A-Revolution-in-Documentaries/157757>  Students will also learn best practices for using video as a tool for advocacy and social change:   1. Video for a specific purpose, not about something – have a clear, S.M.A.R.T. objective for your video (S.M.A.R.T. is an acronymn that stands for Strategic, Measurable, Achievable, Realistic and Time-bound). 2. Know your audience. Whose eyes, not how many eyes, is what matters. 3. Know the action you want your audience to take. 4. Choose the best message, people and story to move your audience to action. 5. Choose the right time and the right place to ensure your audience sees your video.   Source: Video for Change Toolkit <http://toolkit.witness.org/videoadvocacy/5-key-ingredients-video-advocacy>  Engagement with Blue Water Baltimore’s Waterkeeper program will be the culminating civic engagement portion of the project. It will be an extension of the sharing of the information with the diverse stakeholder community at Baltimore Polytechnic Institute, including the school’s environmental awareness clubs and classes, students, staff, administration, parents, alumni and business partners. |

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| Evaluate Action  Students analyze the effectiveness of the action as a solution to the problem or issue based on determined criteria. |

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| When students share their results with the community, it will be a multi-level conversation, not just a didactic presentation. Students will engage in a conversation with all stakeholders and consider all feedback and questions from the broader community. |