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[**WABS ACCESS STEM PBL Unit/Lesson Plan Template**](https://docs.google.com/document/u/1/d/1lzkUygoxlsEvaoczfdcXTIwzbba2y2ON/edit)

**U**NIT OVERVIEW

| **Title of PBL Unit:** Duwamish River Project/Stormwater Treatment at KCIA  **Target Grade Level: 10**  **Subject: English Language Arts**  **Author: Dana Carmichael** |
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| **Problem Statement: *How can King County International Airport effectively steward stormwater runoff?*** |
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| **Unit Overview and Table of Contents**  This unit is part of a multidisciplinary project working with KCIA (King County International Airport) in adapting their stormwater management system for severe rain events. English Language Arts (ELA) will support the work happening in science and social studies in three ways throughout the project: (1) students will do the technical reading on water filtration systems and learn how to analyze an RFP; (2) students will do the technical writing required for the final report and learn to write up a review of the literature, their research and proposed solutions; lastly, (3) students will create presentations for the culminating week of the project. |
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| **Unit Table of Contents**   1. **Overview to Research-Based Proposals and Presentations**    1. **Understanding the “why” and “how” of Grant Writing**    2. **Choosing a Research Question & Initial Assumptions**    3. **Preparing for Research** 2. **Technical Reading Reviewing the literature**    1. **Searching for Sources**    2. **Reading Technical Documents and Research-Based Reports**    3. **Citing Sources** 3. **Technical Writing**     1. **Responding to the Text Research**    2. **Taking Notes: Methods and Purpose**    3. **Responding to and Writing up Group’s Research**    4. **Wrapping It All Up** 4. **Editing**    1. **Sharing First Drafts**    2. **Editing and Revising**    3. **Completing the Final Draft** 5. **Preparing Your Presentation to Present Your Research**     1. **Developing Visuals**    2. **Practicing Speaking**    3. **Writing A One-page Executive Summary**    4. **Presenting Your Research** |
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| **Unit CCSS Standards**  **Reading Standards for Informational Text**  Reading Informational Text 1 — Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.  Reading Informational Text 2 — Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and  refined by specific details; provide an objective summary of the text.  Reading Informational Text 3 — Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.  **Writing Standards**  Writing 2 — Write informative/explanatory texts to examine a topic and convey  ideas, concepts, and information through the selection, organization, and analysis of  relevant content.  A. Introduce a topic; organize ideas, concepts, and information, using strate-  gies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aid comprehension.  Writing 4 — Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.  Writing 5 — Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  Writing 7 — Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  Writing 8 — Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.  Writing 9 — Draw evidence from literary or informational texts to support analysis, reflection, and research. (e.g., "Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning").  Writing 10 — Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.  **Speaking and Listening Standards**  Speaking and Listening 1 — Initiate and participate effectively in a range of collab-  orative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.  A. Come to discussions prepared, having read and researched material under  study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-  reasoned exchange of ideas.  B. Work with peers to set rules for collegial discussions and decision-making  (e.g., informal consensus, taking votes on key issues, presentation of alter-  nate views), clear goals and deadlines, and individual roles as needed.  C. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate oth-  ers into the discussion; and clarify, verify, or challenge ideas and conclusions.  D. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.  Speaking and Listening 2 — Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.  Speaking and Listening 4 — Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, |

| **21st-Century Skills**  Habits of mind and ways of working together help students build their capacity for workplace expectations. What 21st century skills will students be developing in this lesson (e.g. Communication, Collaboration, Critical Thinking, Creativity)?  1.A.1 Use a wide range of idea creation techniques (such as brainstorming)  1.A.2 Create new and worthwhile ideas (both incremental and radical concepts)  1.A.3 Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts  1.B.2 Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work  1.B.3 Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas  2.D.1 Solve different kinds of non-familiar problems in both conventional and innovative ways  2.D.2 Identify and ask significant questions that clarify various points of view and lead to better solutions  3.A.1 Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts  3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams  3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal  3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member  4.B.2 Manage the flow of information from a wide variety of sources  6.A.1 Use technology as a tool to research, organize, evaluate and communicate information  8.C.1 Go beyond basic mastery of skills and/or curriculum to explore and expand one’s own learning and opportunities to gain expertise  8.C.2 Demonstrate initiative to advance skill levels towards a professional level  9.B.1 Respect cultural differences and work effectively with people from a range of social and cultural backgrounds  9.B.2 Respond open-mindedly to different ideas and values  9.B.3 Leverage social and cultural differences to create new ideas and increase both innovation and quality of work  12.A.2 Learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts  12.E.2 Demonstrate knowledge and understanding of society’s impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.)  12.E.4 Investigate and analyze environmental issues, and make accurate conclusions about effective solutions |
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| **Locally and/or personally relevant for students:**  How do students build on their understanding of their school community or on what matters to students? Are there ways to make a strong connection to women or underrepresented minorities in STEM fields – to increase proportionate representation of those groups in STEM?   1. The school is also located near the Duwamish river and many students live near the Duwamish river. Duwamish people and effects on populations that depend on the riverway for recreational use. Connections to the effects on groups that belong to lower socioeconomic status will be made like those who make a living fishing from the Duwamish river or live near the polluted riverways. 2. This project will connect historically marginalized students with the professional STEM community. Our high school is 31.2% female, 1.2% Gender x, and 67.6% male. |
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| **Connections to career and educational pathways:**  How will students learn about connections to career and educational pathways into the unit/lessons?  They will get to learn about how to read, write and produce technical reports as well as respond to requests for proposals, increasing the chances of them garnering future funding. Since most students are interested in technical fields such as engineering, computer programming and aerospace, writing up the solutions they have created based on the literature will help them in their future. They will also get the chance to communicate and share ideas/solutions to professionals in the industry and receive feedback on their ideas. |
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## LESSON OVERVIEW

| **Lesson Number and Title: 1. Overview to Research-Based Proposals and Presentations** |
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| **Problem Statement: What is important when submitting a proposal?** |
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| **Lesson Objectives: Students will be able to identify key criterion in a complex document** |
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| **Lesson Standards:**  Reading Informational Text 2 — Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and  refined by specific details; provide an objective summary of the text.  Reading Informational Text 3 — Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.  Speaking and Listening 1 — Initiate and participate effectively in a range of collab-  orative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.  A. Come to discussions prepared, having read and researched material under  study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-  reasoned exchange of ideas.  C. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate oth-  ers into the discussion; and clarify, verify, or challenge ideas and conclusions. |
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| **Materials:**   * **The RFP from King County International Airport for the project (Note: At the time of writing this lesson, our partnering agency had not yet sent over the RFP. When they have, it will be linked here)** * **Highlighters (electronic or physical)** * **11x17 paper for rubrics** * **rulers** * **markers** |
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**LESSON PREPARATION**

| **Time Required: 1 - 55 minute period** |
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| **Grouping of Students for Instruction:** recommend mixed ability grouping, may pair students with a device if needed. |
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| **What is the instruction? (Consider the PBL procedure that is being addressed here):**   1. **Whole class - Read the RFP while students annotate** 2. **In pairs, students identify key components of the Project’s RFP by reading, chunking text and analyzing main ideas of the document.** 3. **In collaboration with group members, students will design a rubric to judge proposals and present it to the class.** 4. **Students compare the “real” rubric with the one they proposed and look for similarities and differences.** |
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| **Possible Accommodations:** |
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| **Possible Assessment: Students will design a rubric they would use to analyze proposals** |
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| **References and Resources:**  **KCIA - RFP (Coming Soon)**  **Google doc:** [Create a Rubric for the RFP](https://docs.google.com/document/d/1vDw3TCn2nZNz2BY4bVm-zChwTbqUx9qR9rMusROrJfg/edit?usp=sharing) |
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| ***Teacher*** | ***Students*** |
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| *(15 minutes) Teacher and student volunteers read the Project’s RFP together aloud.* | *Discuss the following questions:*   * ***What do you notice about the document?*** * ***What do you think is important?*** |
| *(2-3 minutes)Tell the students about the upcoming project:*  *As you know, we are launching a project in which we will partner with King County International Airport (KCIA) to improve the existing stormwater system, particularly for major rain events, predicted to increase due to climate change.*  *Your groups will be studying the problem and why it is important to solve the issue. At the end all groups will present potential solutions to a panel of experts. Each presentation will be judged on how well it met the specifications in this RFP.* |  |
| (20 minutes) In your groups, analyze the document and determine what is important.  What are your *criteria?*  *How many criteria will you have?*  *What is your scale?* | Give each group access to Create your own Rubric doc Their goal is to create an appropriate rubric google doc based on their group's rationale.  Students may use sample rubrics and choose whichever style seems most appropriate. Final product should be on 11x17 paper and posted for a gallery walk |
| (12 minutes) Teacher offers time checks and directs groups to post rubrics around the room to begin Gallery Walk | Students post rubrics and rotate six times counter-clockwise to review each group’s rubric. |
| (5 minutes)  *Closure*  *Teacher asks students to select the RFP that they think would best evaluate a proposal.*  *(Note: Teacher shares actual rubric if available; if one is not available, teacher will bring the student rubrics to the WABS school team for review).* | Students physically move to the rubric that they believe would best evaluate proposals for the RFP. |