ERASE THE WASTE:
POLLUTION SOLUTION

BY RACHAEL GALLANT

How can you change your life to prevent the effects of pollution through collaboration and engineering?

ELEMENTARY FIRST GRADE

TIMEFRAME 15-20 ONE HOUR SESSIONS

STANDARD BENCHMARKS AND VALUES

- CCSS.ELA-Literacy.SL.1.1.a - Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
- CCSS.ELA-Literacy.SL.1.1.b - Build on others’ talk in conversations by responding to the comments of others through multiple exchanges.
- CCSS.ELA-Literacy.SL.1.1.c - Ask questions to clear up any confusion about the topics and texts under discussion.
- CCSS.ELA-Literacy.SL.1.2 - Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- CCSS.ELA-Literacy.SL.1.3 - Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
- CCSS.ELA-Literacy.SL.1.4 - Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
- CCSS.ELA-Literacy.SL.1.5 - Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.
- MP.2 - Reason abstractly and quantitatively.
- MP.4 - Model with mathematics.
- MP.5 - Use appropriate tools strategically.
- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved objects or tool.
- K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- K-2-ETS1-3: Analyze data from test of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
ENDURING UNDERSTANDING:
• A situation that people want to change or create can be approached as a problem to be solved through engineering.
• Asking questions, making observations, and gathering information are helpful in thinking about problems.
• Before beginning to design a solution, it is important to clearly understand the problem.

CRITICAL SKILLS AND CONCEPTS:
• Ask questions based on observations to find more information about the natural and/or designed world(s).
• Define a simple problem that can be solved through the development of a new or improved object or tool.
• Designs can be conveyed through sketches, physical models, and drawings to help others understand your thinking.
• Analyze data from tests of an object or tool to determine if it works as intended.

AUTHENTIC PERFORMANCE TASK:
For our authentic performance task, students will be creating their own water filters based off of their learning experiences about pollution in our IB unit, “Sharing the Planet”.

Students will be responsible for making a pamphlet about the type of pollution they chose and presenting it to the class.

Students will also visit the Dolphin Quest to see real marine life that will be affected by pollution and given the opportunity to learn about how to protect these animals.

AUTHENTIC AUDIENCE:
Students will be presenting their questions to the principle of our school and will be sharing their ideas about building their water filters with their 5th grade reading buddies.

OTHER EVIDENCE:
Other evidence will include their questing charts, their science journals to record their thinking and designs, and an exit slip page to conclude their understanding.
LEARNING PLAN

Special Note** Leveled Questioning should be taught before this lesson. I taught my students that level one are questions you can see and we point to our eyes, level two is you need to search for more information so get out your telescope to search, and level three is a connection to themselves so point to their heart. We also did a practice together as a class with a picture and passage then placed questions into the column they thought was correct. We then checked our work together. I have included that for you as well.

In this learning plan, you will need 4 pictures of varied types of water pollution. Make sure you have four copies of each picture and that each picture has a different colored back ground color. Hand out the pictures to random students and ask them not to look at it. When students have returned to their seat, students will have about 5 minutes to look at the picture and write down everything that they see under the “I see” section.

After the students have completed this task, have the students group into pairs with the same colored background pictures and discuss the differences of what they saw in this picture under the “We See” section. Next have students find their remaining group members and discuss what they think is happening in the picture they were given in the “We Think” section. Shortly after students have been given time to think about their pictures, students will be given a short reading passage to read about their picture and then form leveled questions about it. Students will need to write their questions on their paper while an adult comes around with a sentence strip and a sharpie to copy their question from the paper. Sentences strips should be labeled with their picture color to show which group it belongs to.

Have students in the group to come up and share their picture with the group to establish understanding while the children sit on the mat with their questions. Students will get to see a variety of pollution in different ways. Ask students questions such as “What do all of these pictures have in common?” or “How could this pollution have been caused?”
Have students come up at a time and read a question that they created. Ask the students to pair share what level they think the question is and why. When they have agreed on a level, have each pair hold up the number of fingers that shows which level they think that question is. If the students have a wide range of answers, select a student, and have them provide the reasoning. Students are often heated about their knowledge and can often lead to a debate.

The next day repeat the process with pictures of pollution solution such as clam farms, sea buckets invented for clean up, and people picking up trash pictures. After the end of rotation, show the students a gallon of water in a clear container that is filled with dirt. You can make a story up about Hawaii or another country sent it to you to make it more realistic for them. Ask them how they could change the quality of the water and the life of the people who live near this type of water. Record student responses and come up with an action plan. This could vary so please be prepared for other responses and action plans. Might not be water filters, but this was our class’s plan.

After students have completed their water filtration system, ask students about other types of pollution that might affect the world and have them list possible types of pollution. Have student then select one of the choices they listed and it becomes their research topic. Students will have about two weeks to complete this assignment and will be able to take it home for parent support.

Students will then be prepared to travel to Kahala Hotel and visit the Dolphin Quest. At the Dolphin Quest, students will have a chance to learn about different sized whales and how they camouflage themselves in the ocean, how humans affect the life cycles, how stingrays defend themselves, and how dolphins can use their special features in the wild.
COLLABORATION

<table>
<thead>
<tr>
<th></th>
<th>DP</th>
<th>MP</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team work</td>
<td>Our team had some arguing and we needed teacher support to help solve problems to agree on design.</td>
<td>Our team was able to work independently and most team members were involved.</td>
<td>Our team was able to work together and have discussions about our thinking with everyone involved.</td>
</tr>
<tr>
<td>Levels of Questioning</td>
<td>I can try my best in asking a level 1, 2, or 3 question and am still practicing.</td>
<td>I can ask level 1 and 2 questions, but I still need some help reaching level 3.</td>
<td>I feel confident in asking level 1, 2, and 3 level questions often labeling them correctly!</td>
</tr>
</tbody>
</table>

REFERENCES/RESOURCES:

The Dolphin Quest Team
Google Online Photos/Information
Teacher Made Resources

Larger Card Stock Paper for Pamphlet
Pen Sharpies
Colored Crayons
Sentence Strips
4 Different Pictures of Pollution
4 Pictures of Different Solutions
Plastic Cups
Cotton Balls
Tubing
Paper
Card Board
Coffee Filters
Glue/Tape
Screen Material
DEAR PARENTS,

As we are wrapping up the school year, we have one final project for our IB Unit, “Sharing the Planet.” Students will be creating an informational brochure about one type of pollution, how it affects us and the environment, and what steps we can take to prevent it.

Students will be making these brochures in class using a larger piece of tag board, but will need your support in finding the information online. Students who do not have access to a computer at home can use the classroom computers after school on Wednesday with a parent note. Students will be able to stay until 1:50 pm to work on their projects and will need transportation home.

Please help your student find the following information by Wednesday, May 11. Students will have a chance to take home their class projects the following weekend and must be returned on Tuesday, May 17th. Projects are due Thursday, May 19. Students must create their own artwork, but may use pictures to draw from.

TYPE OF POLLUTION: ________________________________

1. What is the definition of your Pollution type?
2. What are 3 things you would see to identify your pollution?
3. How is this type of pollution caused?
4. How does the effect of this pollution harm the environment?
5. In what areas of the world does this type of pollution occur?
6. Are there any laws (Hawai‘i or Global) that help keep your type of pollution in check?
7. How can it be prevented by you or others? Name 3 ways.
8. Provide three to five interesting facts about your type of pollution.
# POLLUTION BROCHURE RUBRIC

<table>
<thead>
<tr>
<th>Quality</th>
<th>WP</th>
<th>DP</th>
<th>MP</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students work is missing or incomplete</td>
<td>Students work is messy and could have been improved with more time and care.</td>
<td>Student has put a great deal of time and effort into their project to make it look neat.</td>
<td>Student has gone above and beyond expectations to make it look nice.</td>
</tr>
<tr>
<td>Information</td>
<td>Student has little information included in the brochure, the message or title does not match, and there are no pictures</td>
<td>Student has some of the required information, an unclear title or message, and 1-3 pictures.</td>
<td>Student has answered the questions listed above in the brochure, has a clear message, and has at least 3 or more student created pictures.</td>
<td>Student has gone beyond the asked information and has compared one or more data points, has a convincing message that provokes change, and has colorful and detailed work.</td>
</tr>
<tr>
<td>Organization</td>
<td>Student has little to no organization.</td>
<td>Students work seems to have some organization, but may drift off topic in some areas.</td>
<td>Students work is well organized under titled sections.</td>
<td>Students work is well organized and includes a pre-thought out plan.</td>
</tr>
<tr>
<td>Research</td>
<td>Student came with no research.</td>
<td>Student came with half completed research.</td>
<td>Student completed research on time.</td>
<td>Student came with research completed on time and included pictures that are important for their brochure.</td>
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# POLLUTION WORKSHEET

<table>
<thead>
<tr>
<th>I See...</th>
<th>We Think...</th>
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<tbody>
<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>You See...</th>
<th>We Wonder...</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Level 1:</td>
</tr>
<tr>
<td></td>
<td>Level 2:</td>
</tr>
<tr>
<td></td>
<td>Level 3:</td>
</tr>
</tbody>
</table>
# Leveled Questions Practice

<table>
<thead>
<tr>
<th>What Color Is the Water?</th>
<th>Why Did the River Turn Red?</th>
<th>Where Did This Happen?</th>
</tr>
</thead>
<tbody>
<tr>
<td>What Are the People Doing to Help?</td>
<td>Can You Drink from the River?</td>
<td>How Long Has It Been Like That?</td>
</tr>
<tr>
<td>What Can the People Do to Help?</td>
<td>Does It Smell?</td>
<td>Are There Other Rivers That Look Like That?</td>
</tr>
<tr>
<td>Could That Happen to Us?</td>
<td>What Types of Chemicals Could Make the Water Turn So Red?</td>
<td>How Can We Tell Others About This Problem to Keep It From Happening?</td>
</tr>
<tr>
<td>Who Is Responsible for This River?</td>
<td>How Deep Is the Water?</td>
<td>How Can You Get Chemicals Out of the Water?</td>
</tr>
</tbody>
</table>
## LEVELED QUESTIONS

<table>
<thead>
<tr>
<th>LEVEL 1</th>
<th>LEVEL 2</th>
<th>LEVEL 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can find the answer by looking or reading a passage and answer it using a simple answer.</td>
<td>I can see that I am going to need to keep searching for more information to answer this question.</td>
<td>I can make connections with the others and myself.</td>
</tr>
</tbody>
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