

TGC Fellow Unit Template

Prepared by: Desyl Wood School/Location: PHSSA

Subject: ENVS Grade: 3 Interdisciplinary Unit Title: Clean Water for All
 Time Needed: 10 weeks, 45 min/week

Unit Summary: This unit will explore the importance of clean water to humans, other living things and the environment. They will first explore an area they use frequently for recreation and exploration during school hours, Reedy Creek, and examine it for signs of pollution using water testing kits and by sorting trash and identifying its sources. They will research the history of the cleanup of the James River and how it is currently maintained to be the popular recreational focus it is in Richmond. There will be a lesson on the Chesapeake Bay, tbd, (would like to collaborate with someone from the Chesapeake Bay Foundation). Students will then communicate with experts around the world to further their research on the importance of clean water, e.g. with Dr. Jesse Baker at Project 509 Haiti. Finally, they will communicate with students, local business owners and residents via PSAs in differing formats to inform them of the importance of their part in keeping the local waterways clean and how that can be accomplished.

STAGE 1: Desired Results

ESTABLISHED GOALS:

Science

- 3.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
- a) observations are made and are repeated to ensure accuracy;
 - b) predictions are formulated using a variety of sources of information;
 - d) natural events are sequenced chronologically;

Transfer

Students will be able to independently use their learning to:

1. Identify the impacts of humans on local waterways and the living things that rely on them.
2. Collaborate with other students and community members to implement a plan to reduce littering around school grounds.
3. Devise a campaign to communicate their goals effectively to their target audiences.

Meaning

UNDERSTANDINGS

Students will understand that:

ESSENTIAL QUESTIONS:

<p>e) length, volume, mass, and temperature are estimated and measured in metric and standard English units using proper tools and techniques;</p> <p>f) time is measured to the nearest minute using proper tools and techniques;</p> <p>g) questions are developed to formulate hypotheses;</p> <p>h) data are gathered, charted, graphed, and analyzed;</p> <p>j) inferences are made and conclusions are drawn;</p> <p>k) data are communicated;</p> <p>l) models are designed and built;</p>	<ol style="list-style-type: none"> 1. Clean water is essential for the health of humans, other living things and the environment. 2. Humans impact the cleanliness of water in many ways. 3. Water moves through cycles, gyres and currents that are interconnected across the globe. 4. Through small and large actions, people can work to prevent and repair pollution caused by humans. 	<ol style="list-style-type: none"> 1. Why is clean water important to humans and other living things around the world? 2. What impacts do humans have on the cleanliness of waterways and oceans? 3. How does water move around the world? How is it connected to us? 4. What can be done to solve the problems of water pollution? <p>Phillip->Insert UN Sustainable Development Goals here - water and sanitation, marine pollution</p>
Acquisition		
<p>3.6 The student will investigate and understand that ecosystems support a diversity of plants and animals that share limited resources. Key concepts include</p> <p>a) aquatic ecosystems;</p> <p>3.9 The student will investigate and understand the water cycle and its relationship to life on Earth. Key concepts include</p> <p>a) there are many sources of water on Earth;</p>	<p><i>Students will know:</i></p> <ul style="list-style-type: none"> ● Humans impact the quality of the natural resources around them ● Water quality at Reedy Creek has an impact on the water quality of the world's oceans ● Humans and other living things around the world depend on clean water to survive, yet face problems with unsafe water supplies ● They can make a positive impact on the environment by using arguments based in fact, and being persuasive.-> 	<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> ● Measure accurately and record and interpret data ● Compare and contrast human needs v the needs of other living things ● Understand the perspective of another group of people who have clean water needs-> Michelle add include the perspective of businesses responsible for the pollution. It might help students understand and address the business owners' perspectives/arguments in their

<p>c) the water cycle involves several processes; d) water is essential for living things; and e) water on Earth is limited and needs to be conserved.</p> <p>3.10 The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include</p> <p>b) the effects of human activity on the quality of air, water, and habitat; c) the effects of fire, flood, disease, and erosion on organisms; and d) conservation and resource renewal.</p> <p>GLOBAL COMPETENCY:</p> <ol style="list-style-type: none"> 1. Investigate the world 2. Recognize perspectives other than their own. 3. Communicate effectively with diverse audiences. 4. Take action to improve conditions. <p>TECHNOLOGY USED: Skype Google Docs Google Earth Google Classrooms or Edmodo Google Slides</p>	<p>Melissa- digital citizenship piece reliable sources as they work on being persuasive.</p>	<p>PSAs.</p> <ul style="list-style-type: none"> ● Work together in small groups ● Research using online resources ● Speak respectfully and clearly to experts, ask questions and relevant follow up questions ● Apply artistic skill and creativity to produce a desired result ● Use technology to present their final product
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<p>Prezi</p> <p>RESOURCES:</p> <p>https://populationeducation.org/content/who-polluted-potomac-0</p> <p>Activity with story: Who Polluted the Potomac? Through an interactive story, students experience the pollution of a local river over time and propose methods to protect the river from current and future pollution.</p> <p>https://populationeducation.org/content/who-polluted-potomac-0</p> <p>http://www.northeastern.edu/helmuthlab/lessons/pdfs/grade7z.pdf</p> <p>https://www.worldof7billion.org/wp-content/uploads/2014/08/code-blue-endangered-oceans.pdf</p> <p>Freddie the Fish Pollution Activity (TpT)</p> <p>https://www.theoceancleanup.com/</p>		
Stage 2 - Evidence		
Assessment	Evaluation Criteria (Learning target or Student Will Be Able To)	

<p>Assessments FOR Learning:</p> <ul style="list-style-type: none"> ● Collaboration: group work rubric filled out by group members ● Data: Reedy Creek exploration lab work ● Sequencing impacts: Graphic organizer ● Communication: teacher observation ● History: What I used to think/what I know now 	<ol style="list-style-type: none"> 1. Observe, identify and classify the types of refuse found at the bottom pool of Reedy Creek. 2. Identify watershed for Reedy Creek, the James River, Chesapeake Bay. 3. Determine types and sources of pollution in Reedy Creek. 4. Describe the level of water pollution in the James River 50 years ago, and compare it to the levels now (how the James used to be used and how it is currently used). 5. Build a working model of a water filter that filters out pollutants. 6. (I think I need another thing here to bridge regional to global) 7. Describe how water gets polluted in different parts of the world and how it impacts human health.
<p>Assessments OF Learning:</p> <p>Groups will create a PSA using the media of their choice encouraging people to keep local waterways clean, and informing people of the impact of polluted water on humans, living things, and the environment.</p>	<p>Students will collaborate with each other in small groups to produce a public service announcement using a method of their choice- poster, poem, pamphlet, song, video, etc. Projects will be presented to the class and evaluated by students using a rubric. Two PSAs from each class will be chosen to be presented to the PTA or PHSSA school board, added to the school website, duplicated to be distributed to businesses in the area, depending on the medium in which it was produced.</p>
<p>Stage 3 - Learning Plan</p>	
<p>Week One: Students will explore an area of Reedy Creek, and examine it for visible signs of pollution. They will gather and sort trash, identify its local sources and brainstorm the impact it may have on the ecosystem of the creek. This may include categorizing, weighing, and graphing categorical data, as well as diagramming and mapping items and locations of deposited refuse.</p> <p>Week Two: Students will return to Reedy Creek location and test the creek's health using water testing kits - dissolved O₂, turbidity, temp, pH, macroinvertebrates, etc. and determine the state of the creek's health.</p>	

Week Three: Using the internet and primary sources, students will research the history of the use of the James river, its cleanup, and how it is currently maintained to be an asset to the Parks and Rec system in Richmond and one of the main draws of the city.

Week Four: A guest from the Chesapeake Bay Foundation will come to present on watersheds and the various habitats of the Chesapeake Bay and Atlantic Ocean, with a focus on how different types of pollution affect living things in those ecosystems. OR complete activity “Who Polluted the Potomac?”

Week Five: Students will rotate through stations or work in groups to gain perspective on situations different children face in other countries with clean water needs (read Long Walk for Water). Using Flipgrid, students will aggregate questions that they want to ask experts about clean water issues faced in other countries, and what people can do to prevent/improve water quality for the safety of people and the environment.

Week Six: Students will then communicate with experts around the world to further their research on the importance of clean water, e.g. with Dr. Jesse Baker at Project 509 Haiti, whose work focuses on building rainwater water harvesting systems and clean water education, or with researchers at El Centro de Investigación y Asistencia en Tecnología y Diseño, in Merida, MX, who are currently working on projects for the 20th Annual Science and Technology fair in Mérida in support of National Science Week, the theme this year being “The Water Crisis: Problems and Solutions.”

Week Seven: Based on information gained in research and interviews with experts, students will design (and build? lego?) prototypes of water filtration systems or rainwater catchment systems using the Engineering Design Process

Week Eight: Students will form groups and begin to work on their PSAs, deciding on their target audience, the medium of their message and the message itself.

Week Nine: Finish working on PSAs

Week 10: Students will present, post or distribute their PSAs to their target audiences.

TGC FELLOWS UBD Lesson Template

Lesson Title: What would You Do, Too? Subject: Science, Social Studies

Prepared by: Desyl Wood

Materials Needed: Computers, index cards or INB foldables, primary sources (newspaper articles, etc)

Time period: 45 min. +

Global Competency: Investigate the world; Communication; Perspective

Where is the lesson going?
(Learning Target or SWBAT)

The student will be able to identify and describe several types of water pollution, their sources and their effects on humans and environment in different countries. Students will be able to consider what it would be like to live a day in the life of a student their age with the same water challenges, and describe what that experience would entail. They will be able to develop questions based on this information and prepare them to ask experts in the field.

Hook:

Show short video about cholera in Haiti's water and what a mom did for her children:
https://www.youtube.com/watch?v=EwAQy_6XVBk

Ask students: How did you feel when you saw that story? What would you have done if you ran out of safe water to drink and you were so thirsty? Would you drink the bad water even if you could get very ill? What would you do if you were that mother? If you were one of the children? How do you think the water got contaminated to begin with?

Equip:

In stations, 1-students will be presented with short fictional reading passages/scenarios of children in different countries who face water safety issues. Students will answer questions designed to stimulate empathetic thinking. 2-students will read short non-fiction reading passages about countries, types of water pollution they face, and effects on people and environment, and fill out a graphic organizer with a country of their choice. 3- students will watch a video about how young people design a solution to a water pollution problem, then write a sentence summarizing their accomplishment.

Tailored Differentiation:

Scenarios and primary source articles can be at different reading levels, students can produce responses in different ways- as free writes, in paragraphs, bullet lists, labeled diagrams, graphic organizer, comic strips.

<https://www.globalyoungvoices.com/all-articles/2017/1/31/two-teenage-girls-find-the-elixir-to-indias-clean-water-crisis>

Rethink and revise:

Based on the knowledge they gained in their groups, students will brainstorm questions for the experts they will be communicating with the following week. They will use padlet to aggregate, organize and keep track of everyone's questions about clean water issues faced in other countries, and what people can do to prevent/improve water quality for the safety of people and the environment.

Evaluate:

In their INB, students answer this question: If you had all the money in the world, which water pollution problem in the world would you solve first, and why?

Notes:

Review Kagen structures with students depending on which class this is done with.

Organization:

Queue youtube videos on lesson plan

Print out reading passages, photos and articles