INVESTIGATING PLASTIC

Teachers: Glenn Berry, Chloe Readel, Matthew Caamano		**Duration: 3 Months**
Subject/Course: Science	**School: McKinley**	**Grade Level: 6**
Collaborating Organizations: Sonoma County Regional Parks		

Standards Met (NGSS, CCSS, or otherwise) Please include full text of standards.	**NGSS** MS- ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. **ELA/Literacy** CCSS.ELA-LITERACY.RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts. WHST.6-8.7 - Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ESS3-3) WHST.6-8.8 - Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ESS3-3) WHST.6-8.9 - Draw evidence from informational texts to support analysis reflection, and research. (MS-ESS3-3) **Math** 6.EE.B.6 - Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS3-3) 6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-ESS3-3) **Art** 2.4 Create increasingly complex original works of art reflecting personal choices and increased technical skill.
Project Summary (include student role, issue, problem or challenge, action taken, and purpose/beneficiary)	Students will learn about pollutants in our watershed with a focus on plastics: what happens to them, what impact they have on the environment, and what can be done about it. Students will use the issue of plastics in our oceans to build knowledge, analyze arguments, verify claims, and develop plans for how to minimize our community's contribution to this problem. Students will conduct two clean ups of Lynch creek and will sort and analyze the trash that is recovered. Other data sources will be investigated (data from Friends of the River past clean ups, state water board information, and home trash inventories). Students will analyze the types of trash that are found in the clean ups and at home, and then reflect how they may be contributing to it. Students will develop and implement a plan to reduce the plastic waste

	produced by the school and at home. Students will produce a final project that includes but is not limited to: educating the local community, petitioning for change, and drawing attention to the problem. All students will work together to create an art installation with an environmental message to be installed on campus						
Essential Question Question students will explore throughout the course of the unit.	What happens to plastic items once they are discarded? How much plastic is in our local watershed? How does it impact our environment, locally and globally? What can we do about it?						
Key Learning Objectives and Assessments Concrete objectives for student skill building and comprehension and how these will be measured.	**Learning Objective**				**Assessment**		
	Students will build an understanding of how much plastic they produce				Students will measure the amount of plastics in the trash at home, at school, and at local creeks. Students will display this data, and extrapolations that can be reasonably made from it, on posters.		
	Students will learn about what happens to plastics during production, use, and disposal.				Students will produce one or more of the following to educate the wider community about the life cycle of plastic: digital presentations, short films, public service announcement, and informational posters.		
	Students will learn to deconstruct arguments, analyze claims, and assess the validity of scientific sources.				Students will present an argument to the class and deconstruct it. Presentations will include a list the claims, evidence for and against these claims, and a final judgment about the validity of these claims.		
	Students will build skills that will enable them to design solutions to the problem of plastic waste supported by multiple sources of evidence and consistent with scientific ideas and theories.				Students will design solutions to minimize their school and their community's contribution to plastic pollution.		
	Students will educate the community about the problems that plastics presents and actions that can be taken to minimize them.				Students will produce a final project that includes but is not limited to: educating the local community (PSAs, short films, posters), petitioning for change (city council, and locally elected representatives), and drawing attention to the problem (letters to the editor, social media)		
	Students will express an environmental message or desire through art to the school community.				Students will create an art installation that promotes an environmental message.		
Orientation	In-Class Visit	Yes	Field Trip to River Heritage Center		Other		If other, describe in timeline how you will meet entry activity requirements

Making Products Public Include how student work will be shared with community members and/or organizations, who students will engage with during/at end of project, and which product(s) will be presented at the Watershed Classroom Student Showcase.	Students will educate the school community on the problem presented by plastic waste and design solutions to minimize their contribution of plastics to the environment. Students will choose how to share this information with the broader community (such as speaking at City Council Meetings, making YouTube Videos, presenting to other schools, writing letters to the editor, and any other public forum students might be interested in pursuing. Students will decide how they want to present their project at the student showcase. The whole 6th grade will create an art installation out of collected plastic bottle caps that will have an environmental message. This installation will be on campus and viewable by the school community.

PROJECT TIMELINE

Please list all activities which are part of the unit in the order they will be implemented. Timeline must include pre and post-assessments, other in-class assessments, an entry activity, at least three outdoor fieldwork activities, a plan for participation in the student showcase, and any other supporting activities and classwork.

Activity	**Type of Activity** (Field Work, In-Class, Presentation, Assessment)	**Description**	**Resources Needed**	**Exact or Approximate Dates**
Name the activity	***Field Work:*** *Any hands-on outdoor lesson or field trips* ***In-Class:*** *Any in-class activity or project* ***Presentation:*** *Any activity during which students share their work with each other or an outside audience* ***Assessment:*** *Any written or oral exams given to assess student understanding and knowledge*	*A thorough outline of the activity.*	*All reading materials, activity materials and equipment, transportation, third party help, or other resources needed to make the activity possible.*	*Please be as specific as possible so that we best know when to reach out with resources and tools to aid in implementation. Exact dates will be emitted from publicly shared version to protect student privacy.*
Orientation	In class visit			Early January
Hook	In class	Read Press Democrat article about local boy who has pulled over 2,215 pounds of garbage from the Petaluma River	http://www.pressdemocrat.com/news/6898734-181/petaluma-boy-pulls-2215-pounds?artslide=0	January
Deconstructing Arguments	In class Presentations Assessment	Students will watch the video *Open Your Eyes*, list claims made, look for evidence for and against these claims.	Common Sense Education – Evaluating Legitimate Sources https://www.commonsense.org/education/lesson-plans/evaluating-legitimate-sources Video from http://www.plasticpollutioncoalition.org/	January

At home and at school plastic inventory	In class Assessment	Students will determine their family's use of plastic shopping bags, and compare it with that of their classmates. They will use this information to estimate an annual total for their class, school, and residents of Petaluma. Students will then explore ways to reduce their use of plastic shopping bags.	Marine Debris Fact Sheets from NOAA's Marine Debris Program (http://marinedebris.noaa.gov). International Coastal Cleanup report from Ocean Conservancy Student Worksheet (www.oceanconservancy.org)	January
Cleanup	Field Work	Students will participate in two clean ups: Lynch Creek and another tributary to the Petaluma River. They will sort and weigh the gathered trash.	Clean Up Supplies	January - February
Only Rain Down the Drain -	Field Work	Students will travel to Spring Lake Regional Park and participate in activities that build on their understanding of the Russian River Watershed and non-point source pollution, and the effects of water pollution.	Bus	February - March
Student solution design and final project	In class Presentations Assessment	Students will produce a final project that includes but is not limited to: educating the local community (PSAs, short films, posters), petitioning for change (city council, and locally elected representatives), and drawing attention to the problem (letters to the editor, social media)		March
Student art installation	In class Presentation Assessment	Students will decide on a key message that can be spelled out with reclaimed bottle caps. Students will create the message and display it in a visible location	Reclaimed, found, collected plastic bottle caps	March

Please add more rows if needed. (Right click in last box, "Insert Row Below")

Form adapted from Buck Institute for Education's Project Design: Overview tool. Original form available at **bie.org**

Other Notes: