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Additional Participants: Eric Norstad will be implementing many, but not all, of the same learning objectives and activities.

School Name: McNear School

Grade Level(s): Fourth Grade

Course:

Name of Watershed Classroom Unit/Project: Exploring Local and Global Environments- Past, Present, and Future

Integrated Academic Disciplines: Science, Social Studies, English Language Arts, and Math

Implementation Timeline: This is a year-long unit of study.

Key Learning Objectives: -Learn about local and global watersheds and their connection to global climate

-Learn how to use science note booking to record observations in the field

-Learn how to collect data in the field

-Learn practices for mitigating the negative effects of climate change

-Learn how to prepare for and to present learnings and recommendations to a public audience

Provide a brief (50 word max.) description of this curriculum proposal, including the essential question.: An overarching theme of, "Exploring global and local environments- past, present, and future" will guide fourth graders' comparative investigations of their local watershed and part of the world's largest watershed, the Peruvian Amazon river and rainforest. Connections will be made across the curriculum to explore how the watersheds are similar, different, and interconnected; especially with regard to global climate. This will include having students gather base-line data of the section of Thompson Creek that borders one side of McNear School's campus. The baseline data will be used in the future to develop and implement a climate-smart restoration of this section of the creek that will then open up future access for McNear students to engage in expanded outdoor and science learning.

Provide a brief description (100 words max.) of how this coursework will integrate the core concepts of Geoliteracy: Interactions, Interconnections and Implications:

Fourth graders will study the interaction of various aspects of local and global watersheds such as plant and animal life, erosion and deposition, and climate factors at play in their local watershed and in the Amazon watershed. They will analyze the interconnections between the two such as the many products we use on a daily basis that come from the Amazon and how the Amazon rainforest affects global climate.

Through this comparative study of a local and a significant global watershed, students will understand the many implications between the two watershed systems and the need to be strong environmental stewards of both.

Describe the fieldwork activities involving the Petaluma River/Wetlands.

Curriculum must include a minimum of three outdoor watershed educational experiences.: Students will participate in several fieldwork activities during this unit of study. They will conduct at least 3 field observations using their science note books to record observations of an accessible part of Thompson Creek. During the first visit, students will record observations of the creek in fall. During the second visit, students will record their observations of evidence for erosion and deposition, and the final visit will be to record any changes in the environment that have occurred since the last visit. Students will go on another "Walking Field Trip" to trace the route of Thompson Creek and its entry point into the Petaluma River. In the spring, the students will work with interns from the STRAW program to gather base-line data of the section of Thompson Creek that runs along one border of McNear School. Data collected will pertain to status of current plant and animal life and what ways the creek currently supports or doesn't support a healthy climate. Students will also visit the Heritage Center to learn more about the geography, geology, and health of the Petaluma River.

Describe any other hands-on learning activities: In addition to field study work, students will use the FOSS science and Mystery Science curriculum to learn Earth science standards as defined by the Next Generation Science Standards. Both programs will provide content that will support student studies of local and global watersheds.

Content Standards addressed: The following Common Core and NGSS standards will be addressed in this unit of study:

CCSS.ELA-LITERACY.RI.4.7

Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

CCSS.ELA-LITERACY.RI.4.10

By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Identify evidence from patterns in rock formations and fossils in rock layers for changes in a landscape over time to support an explanation for changes in a landscape over time. 4-ESS1-1

Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. 4-ESS2-1

Analyze and interpret data from maps to describe patterns of Earth's features. 4-ESS2-2

Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. 4-ESS3-2

Reading Tasks: What primary documents and informational texts will be read/analyzed?: Informational texts from the FOSS science curriculum, Newsela, ReadWorks, and other sources will be used to support student investigations.

Writing Tasks: What kinds of writing tasks (Arguments and Drawing Evidence) will be required?: Students will use their science notebooks to record observations and to construct explanations of observed phenomena. They will also need to write up their observations, conclusions, and recommendations for public presentations.

Collaboration: How will students collaborate, communicate and organize together (Speaking and Listening/Discussion): Students will regularly work in pairs and in collaborative groups when doing field observations, FOSS science investigations, and during content reading, writing, and academic discourse.

Integration of Media Sources and Skills: How will students use technology for research, communication, documentation and or presentation purposes?: Students will use their iPads to research information about the local watershed and the Amazon watershed/rainforest, to photograph observed phenomena during field study outings, and to create public presentations.

CA Core Standards-based Assessments: How will students demonstrate their acquisition of new knowledge and skills?: Students will demonstrate growth in their knowledge about local watersheds as evidenced by pre and post test scores on the Watershed Classroom online assessments.

Students will demonstrate knowledge of Earth systems standards as evidenced through assessments provided by the FOSS and Mystery Science curriculum, teacher observation, and their science note book entries.

Presentation of Knowledge/Student Public Forum: Students may publicly present their projects and learning at the Petaluma City Schools Innovation, and Watershed Classroom Showcases, at a school site assembly, PTA meeting, or a School Board meeting.

Evaluation of Knowledge Mastery & Attitude Changes: Watershed Classroom assessments will be utilized as previously mentioned. Student public presentations will be evidence of their increased interest in being good stewards for local and global watersheds.