

Local and Global Watershed Stewards 2018-19

McNear School Fourth Grades

Mrs. Franklin/Mrs. Santia and Mr. Norstad

***Note- this outline will be refined to include additional activities and academic standards after the August 2018 Watershed Classroom professional development.**

Learning Objectives

- Learn about local and global watersheds and their connection to global climate.
- Consider and address the overarching question, "Can Thompson Creek become viable habitat once again for steelhead trout?"
- Learn about the issues around invasive plants and the reasons for planting native plants (emphasis on native oak trees.)
- Learn how to use science notebooking to record observations in the field.
- Learn how to collect data in the field.
- Engage in citizen science.
- Design and implement a schoolyard/creek field investigation.
- Design and create habitat for local birds.
- Learn how to prepare for and present learnings and recommendations to a public audience

Overview

An overarching theme of, "Exploring global and local environments- past, present, and future" will guide fourth graders' descriptive and 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 continue to gather baseline data of the section of Thompson Creek that borders one side of McNear School's campus. The baseline data will be used to continue developing climate-smart restoration of this section of the creek opening up access for McNear students to engage in expanded outdoor and science learning.

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 areas 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.

Fieldwork Activities

Students will participate in several fieldwork activities in their local watershed this year:

- They will conduct field observations using their science notebooks to map and record observations of an accessible part of Thompson Creek.
- They will continue restoration work with environmental education partner, STRAW (students and teachers restoring a watershed.) This work will include removing more invasive plants and planting native plants in their place.
- Using funds from a NOAA Climate Stewards grant, students will research plants best suited for supporting local birds. This will include building and installing bird feeders and more bird boxes.

- Using funds from NOAA Ocean Guardians grant (hoping for award announcement soon), students will use scientific tools such as water quality testing kits, environmental meters, (tests for light, wind, temperature, and humidity), a soil oven to test for soil moisture, and binoculars to collect data from the creek and school site. This will support the goal of collecting data over time to help inform knowledge about systems in the local watershed.
- Students will engage in bioblitzes to record the species observed 3 times during the year. This data will be added to the data recorded in 2017-2018.
- Students will go on several field trips including:
 - A walking field trip to trace the route of Thompson Creek and its entry point into the Petaluma River.
 - To the David Yearsley River Heritage Center to learn more about the geography, geology, and health of the Petaluma River.
 - To the Bay Model in Sausalito to see a bigger picture of the Bay Area watershed systems.
 - To the top of Mount Burdell in Novato to see where the Petaluma River flows into San Pablo Bay.
 - To the Casa Grande Fish Hatchery to learn more about its creek restoration program and efforts to raise steelhead trout.
- Students will get outside once a week at their school site to make observations and collect data to upload to Citizen Science programs such as eBird and iNaturalist.

Curriculum Support

In addition to field study work, students will use a variety of science curriculum such as the FOSS science and Mystery Science programs to learn Earth and Life 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.

Academic Standards

The following Common Core and NGSS standards may 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

Informational texts from the FOSS science curriculum, Newsela, ReadWorks, and other sources will be used to support student investigations.

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.

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.

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 via slideshows, iMovies, etc.

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 curriculum, teacher observation, and their science notebook entries.

Students may publicly present their projects and learning at the Watershed Classroom Showcases, site assembly, PTA, or at a School Board meeting.

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.

The following are some of the common core state standards and Next Generation Standards that may be addressed in this unit:

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.

LS1.A: Structure and Function

Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

LS1.D: Information Processing

Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)

PS4.A: Wave Properties

Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. (4-PS4-1)
Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1)

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

History-Social Science Standards may be included in this unit after teachers receive more information about how many of the standards have environmental literacy applications from the August 2018, Watershed Classroom professional development.

Additional Support Materials

Informational texts from the FOSS science curriculum, Newsela, ReadWorks, and other sources will be used to support student investigations.

Science Notebooking/Nature Journaling

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.

Assessments

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 curriculum, teacher observation, and their science notebook entries.