

Investigating the Marsh Creek Watershed



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Subject/Grade: 7th Grade Science

1-2 Sentence Lesson Summary

Students will explore water quality systems and synthesize that information to monitor the quality of water in the two creeks that run on either side of the school. They will analyze this information to explore solutions to improve water quality and advocate for better local behaviors to keep the creeks in good ecological standing.

Driving Question that Students Will Explore

Can we help bring salmon back to Marsh Creek?

Water Industry Connection (e.g., an industry-related career, skill, or challenge; addresses **reducing water pollutants, conserving water resources, and/or inspiring watershed stewardship**)

Bristow Middle School has two creeks on either side of it. These two creeks feed into Marsh Creek which drains into the Delta. Marsh Creek is a waterway that salmon historically use for spawning. Eighteen years ago both creeks had salmon fry in them. There have not been salmon fry in either creek for many years and Marsh Creek has seen very few salmon spawning in recent years. Salmon are in low numbers and this is affecting the fishing industry and more importantly the ecosystem. Educating students and the community will help address the need to reduce pollutants in our waterways, conserve water, and build a commitment to keep Marsh Creek and its watershed healthy to bring back the salmon. This is important to me because my brother is a commercial fisherman and his livelihood is directly impacted. It is also important to me because students need to know how they treat water is directly related to the health of the ecosystem and the health of Marsh Creek. Giving students an opportunity to be directly involved with the two creeks that are located on either side of their school creates interest and action.

Visiting Contra Costa Water District inspired me to bring this to reality. They have a very good education outreach program that will support us in our endeavor to bring salmon back to Marsh Creek.

Learning Goals: Make sure to address how your lesson will:

- Involve your students in a [Community Environmental Action](#)
- Develop Critical Thinking Skills (e.g. CERs, Student Inquiry)

Critical Thinking Days 1 - 3

- Students will analyze historical salmon runs in Marsh Creek and use this information to compare past runs with current runs.
- Students will investigate water use and discover their water footprint to inform their future actions with water.
- Students will investigate how watersheds can be affected by human behavior and

analyze how these behaviors affect Marsh Creek.

Inquiry and Investigation Days 4 - 6

- Students will analyze water quality practices to monitor the quality of water found in the two creeks that border the school.
- Students will synthesize the data they have gathered to advocate for responsible water use.

Stewardship Days 7 - 10

- Students will propose solutions to improve water quality in the Marsh Creek watershed that will improve conditions to help salmon return to the two creeks on either side of their school.

Instructional Outline: This should be the bulk of your writing. Bullets of what the students will do throughout the lesson to reach the learning goals you have set.

Hook: Students will use a map of Brentwood to find their school, neighborhood, and house. Using the maps they will create a class list of features that are displayed on the map. They will highlight Deer Creek and Sand Creek and Marsh Creek. A question and answer session will address how the two creeks are vulnerable to human activity and a class list will be made. They will access prior knowledge to brainstorm life that is dependent upon the three creeks. They will watch a video of a 2016 Marsh Creek Salmon run and record the life they see in their science journal. They will be introduced to the driving question - Can we help bring salmon back to Marsh Creek? They will then answer this question in their science journal based on prior knowledge and the work done today.

See link for more information. [Hook Activity Link](#)

During Instruction:

Day 1 - Hook Activity outlined above

Day 2 - *Essential Question - What is your water footprint?*

Students will view a slideshow from waterfootprint.org that explains water use and distribution around the world and explains what a water footprint is.

Using the Conserve Water activity from Project Wet students will:

- Analyze daily activities that require water
- Perform activities that demonstrate how much water is used for a simple daily activity
- Identify ways to conserve water by finding their water footprint
- Discuss how personal water conservation can add up to huge water savings

Students will reflect and summarize their learning in their science journal and attach the data they gathered from the activity.

Day 3 - *Essential Questions - What is a watershed? How does human activity impact watersheds?*

Students will learn what a watershed is using a presentation. Students will investigate how water moves through a watershed and how human activity can impact watersheds.

Using Healthy Natural Environments activity from Project Wet students will:

- Demonstrate how water moves through a watershed by using a model
- Compare and contrast the amount of water flowing through a watershed based on variations in weather and climate
- Discover how water moves trash and debris through a watershed using a model
- Create a hydrograph based on data gathered from the simulations

Students will reflect and summarize their learning in their science journal and attach the

data they gathered from the activity.

Days 4, 5, and 6 - Essential Question: Are our two creeks, Sand and Deer, healthy?

These are two days of field work and one day of data analysis. One day will be spent gathering data from Sand Creek and another day will be spent gathering data from Deer Creek. One day will be spent in class analyzing the data gathered to decide if the two creeks are healthy.

Using Water Quality Citizen Science Project Kit students will: (for Sand and Deer Creeks)

- Make general observations in four different locations and record findings
- Collect water samples at the four different locations to measure temperature, total dissolved solids, dissolved oxygen, pH, hardness, chlorine, lead, iron, copper, nitrate and nitrite and record results.
- Analyze results of data and decide if the two creeks are healthy.

Students will reflect and summarize their learning in their science journal and attach the data they gathered from the activity.

Day 7 - Essential Question: What do salmon need for a healthy return to our two creeks?

Students will identify problem areas the two creeks may have based on the results of the field work. They will research what can be done to restore the two creeks to encourage a salmon return.

Students will reflect and summarize their learning in their science journal and attach the data they gathered from the activity.

Day 8 and 9 - Essential Question: What can we do to improve the health of our two creeks?

Students will use their science journals and findings to propose solutions that can be shared with students at Bristow and with the community to bring salmon back to Marsh Creek. This is an open ended option for students. They will be provided with a menu of choices to pick from to propose their solutions.

Day 10 - Essential Question: Can we bring salmon back to Marsh Creek?

Students will write a scientific explanation describing how salmon could return to Marsh Creek. This would be the assessment.

Use During Instruction Activities Slide Deck. This is a two week scope or more.

Reflection - Students will reflect on the scope by reviewing their science journals and will write a summary of what they learned from the scope and what they hope to continue moving forward.

Standards: Common Core, NGSS, CTE, GoalBook or another state or national list.

1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
2. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
3. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

NGSS: MS- LS2-1, MS-LS2-3, MS-LS2-4, MS-LS2-5, MS-ESS2-1, MS-ESS2-2, MS-ESS2-4, MS-ESS2-5, MS-ESS3-1, MS-ESS3-3, MS-ESS3-4

Assessment: How will you check your students' understanding? Check out these [creative assessments](#) if helpful.

Scientific Explanation using claim, evidence, and reasoning.
Menu choice to showcase solutions

Materials/Resources

[https://baynature.org/article/explore-marsh-creek-regional-trail/
Marsh Creek/Delta Road Salmon Run Brentwood, Ca.2016](https://baynature.org/article/explore-marsh-creek-regional-trail/Marsh-Creek-Delta-Road-Salmon-Run-Brentwood-Ca.2016)
[Beyond the Water Cycle: Teaching About Water Footprints](#)
[Project Wet Conserve Water Activity pages 23 to 30](#)
[Water Quality Citizen Science Project Kit](#)
[CCWD Water Education](#)