

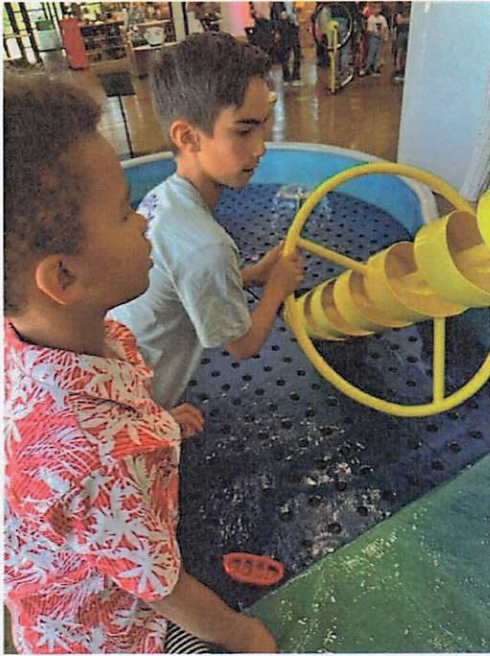
Cottonwood Elementary 1st graders





Cottonwood Elementary 1st graders - interacting with the Colorado River Water exhibit

Johnson Elementary, 2nd graders at Eureka Science Museum, May 2024



PEPO Grant Reporting Summary

Coldharbour Institute used the support provided by the Gunnison Basin Roundtable to create water resource outreach materials to use with classes, field trips and workshop participants visiting the Coldharbour Ranch and engaging in our programming. During the funding agreement period we were able to use these outreach materials with youth visiting the ranch for events/field days, students participating in classes at the ranch, during workshop and conferences, and to provide them during outreach events (youth internship fairs, etc.). Our estimated direct engagement included presenting on our water resources to approximately 140 individuals. We estimate that our other outreach activities (web-based, leaving materials in accessible places, sending brochures home during events) reached approximately 60 additional youth.

Early summer Coldharbour Institute staff created talking points on our water resources and developed a series of brochures to be used during different outreach opportunities.

Attachment A: Outreach Materials includes proofs of three brochures developed as part of this process. These materials were used during outreach in the summer and fall.

During activities at the ranch Coldharbour staff (fellows & Executive Director) provided educational tours on the ranch. During these tours we showed participants irrigation ditches, diversion structures and headgates, drip irrigation, our historic well, our wetland conservation and grazing areas, and our water quality monitoring sites. Materials were provided for participants to take home providing an overview of these uses. We also cultivated direct engagement during presentations to classrooms and during agricultural workshops. Materials were also distributed through the Coldharbour newsletter, shared through social media, and distributed from the Coldharbour office. Brochures are provided on the Coldharbour website for open access and physically available for those visiting the ranch for volunteer days.

As a result of this focused engagement, we were able to initiate great conversations about how water use on the ranch is interrelated. While we intentionally cultivated youth participants, we were able to also reach younger children and senior participants as well.

Finally, our Fellow updated our Healthy Watershed Program page with initial outreach materials on Coldharbour's water resources.

While Coldharbour exceeded the number of participants proposed in our agreement, we will be using these materials to reach an even larger audience in the future. Coldharbour Institute intends to continue to use these materials during the following activities in 2025:

- During public tours of the ranch
- During planned K-12 field trips (we have 8 visits scheduled so far for 2025)

- For participants in our restoration training workshops
- During public outreach generally

Supporting Attachments:

Attachment A: Outreach Materials

Attachment B: Photos of Water Education at the Coldharbour Ranch

Attachment C: PEPO Budget Narrative

Howdy there young ranchers, farmers, and outdoor adventurers! Today I want to talk to all of you on a very important subject, water!



Water is important in everything that we do on our ranch. Let's explore how the Coldharbour Ranch uses water from our river- Tomichi Creek!

About Coldharbour

Coldharbour Institute is a 501(c)(3) non-profit organization in Gunnison, Colorado whose mission is to educate, collaborate, and demonstrate practices that bring sustainable practices to our community. Our programs focus on *regenerative agriculture, equitable solar solutions, healthy watersheds, and education/research*, along with operating the 334 acre ranch that is right on Tomichi Creek.

Follow Us!

@ Coldharbour Institute



Water on the Ranch

Let Learn about Water at Coldharbours Ranch



Coldharbour
Institute

Water for Irrigation:

Just like you need to drink water, so do our plants! Our ranchers use water to make sure that our plants are getting plenty of water. Ranchers dig ditches into the ground to help move water over fields to grow grass. This grass provides food for animals, including cows. Cows love to munch on this grass and hay all year long!



Water for Vegetables:

Eating vegetables is important to keep us strong and healthy. Our farmers use water to grow all our favorite vegetables like lettuce, carrots, and tomatoes. Water helps these yummy vegetables grow big and juicy.



Water for Pigs:

Did you know that pigs also use water? Pigs need clean water to drink, grow their food, and make mud- so they can play in it all day! Ranchers make sure their pigs have plenty of fresh water every day.



Water for Fish:

Tomichi Creek runs right through our farm. This creek is home to fish, including wriggly trout. These fish need clean water to swim, breathe, and find food. We share water with these fish in many ways; we try our best to make sure that they have enough clean water to thrive.



Water for Us!

Just like you need water to drink, cook, and clean, so do all the people who live and work on the ranch. On the Coldharbour Ranch we have a well that has provided water for humans to garden and drink for over 100 years!



Remember...

Water is precious, so we need to use it wisely! On the ranch we are always finding ways to save water and take care of this important resource.

¡Hola, rancheros,
granjeros y jóvenes
aventureros! Hoy quiero
hablarles de un asunto
muy importante, ¡el
agua!



El agua es importante para
todo lo que hacemos en
nuestro rancho. Exploremos
cómo el rancho Coldharbour
usa el agua de nuestro río—
¡Tomichi Creek!

Sobre Coldharbour

El Instituto Coldharbour es una organización no gubernamental (ONG) 501(c)(3) en Colorado. Nuestra misión es educar a la gente sobre las prácticas regenerativas y restaurativas que mejoran la salud de las tierras productivas y las cuencas hidrográficas. Usamos nuestro rancho productivo de 334 acres al lado de Tomichi Creek como un salón de clases dónde los niños, estudiantes y miembros de la comunidad pueden dedicarse al aprendizaje práctico.

¡Síguenos!

@ Coldharbour Institute



www.coldharbourinstitute.org

Agua en el rancho

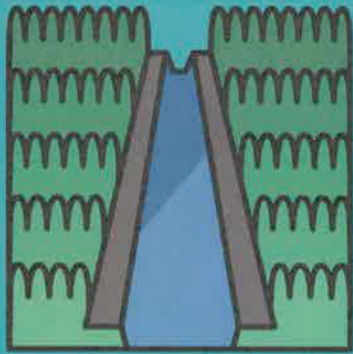
Aprendamos del agua
en el rancho de
Coldharbour



Coldharbour
Institute

Agua para la irrigación

¡Tal como necesitas agua para beber, también la necesitan nuestras plantas! Nuestros rancheros usan el agua para asegurar que nuestras plantas reciben suficiente agua. Para cultivar pasto nuestros rancheros cavan zanjas en la tierra para ayudar a que el agua se distribuya por encima de los campos. Este pasto aporta comida para los animales, incluyendo las vacas. ¡A las vacas les encanta saborear el pasto y el heno todo el año!



Agua para los vegetales

Comer vegetales es importante para mantenernos fuertes y sanos. Nuestros granjeros usan el agua para cultivar nuestros vegetales favoritos como la lechuga, las zanahorias, y los tomates. El agua les ayuda a estos deliciosos vegetales hacerse grandes y jugosos.



Agua para los cerdos

¿Sabes que los cerdos también usan el agua? Ellos necesitan agua limpia para beber, para que cultivemos sus alimentos y para hacer barro. ¡Les gusta jugar en el barro todo el día! Los rancheros se aseguran que sus cerdos tienen suficiente agua fresca cada día.



Agua para los peces

El Tomichi Creek atraviesa el medio de nuestro rancho. Este arroyo es el hogar de peces, incluyendo las truchas. Estos peces necesitan agua limpia para nadar, respirar, y encontrar comida. Compartimos el agua con estos peces en muchas maneras e intentamos asegurar que tengan bastante agua limpia para prosperar.



¡Agua para nosotros!

Tal como tú necesitas agua para beber, cocinar, y limpiar, también la necesita toda la gente que vive y trabaja en el rancho. ¡En el rancho Coldharbour tenemos un pozo que ha producido agua para los humanos para beber y cultivar comida por más de 100 años!



Recuerda:
el agua es preciosa ¡Así que la tenemos que usar sabiamente! En el rancho siempre estamos encontrando maneras de ahorrar el agua y cuidar este recurso importantísimo.

**At Coldharbour Ranch,
water is more than just a
resource - it's the
lifeblood that sustains
our land and the
ecosystems that we
steward.**



We work with our
producers to
balance the
needs of a
working ranch
with our wetland
and aquatic
ecosystems.


About Coldharbour

Coldharbour Institute is a 501(c)(3) that advances regenerative practices to improve the health of working agricultural lands and watersheds through education, research, and applied practices.



Regenerative practices sustain communities by actively replenishing resources as they are used. Regenerative agricultural practices balance productivity with improving soil conditions and sustainable water management.

Follow Us!

 Coldharbour Institute

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www.coldharbourinstitute.org




Coldharbour
Institute

Water on Coldharbour Ranch

Tomichi
Creek,
our water
source

Irrigating Pastures



Parker Pastures grazes cattle on our lands. Greening up our pastures is made possible by our irrigation ditches, diversion structures, and water rights dating back to the 1870s. Over the years, we have updated several of our diversion structures to allow for better fish passage on Tomichi Creek. This helps us protect our fishery while maintaining our agricultural practices on the ranch.

Farming at Coldharbour

We engage in regenerative agriculture practices by working our lands in a manner that improves soil health and by cultivating produce through techniques that cycle carbon and nutrients back into the soil. We use drip irrigation for vegetable production to ensure that water is delivered where needed most.



Supporting Wetland Ecosystems

In 1996 Butch and Judy Clark worked with the National Resource Conservation Services to establish a 242 acre wetland conservation easement on the ranch. The wetlands on our property are vital habitats for a diverse range of wildlife. We work tirelessly to protect these ecosystems, ensuring that they receive adequate water flow to maintain their biodiversity.

Homesteading at Coldharbour

It's not all about animals and vegetables. Many people have called the ranch home. When Clyde Welch built the homestead house in 1912, he hand-dug a well to provide for the historic homestead

gardens, and stock watering near the house. To this day we're still using his historic well.



A Thriving Fishery

2.5 miles of Tomichi Creek run through the Coldharbour Ranch. It's important for us to maintain the health of our fishery and riparian area. Robust riparian vegetation provides shade for the creek and reduces sedimentation, improving conditions for our fishery.



Water Stewardship

Coldharbour Institute is constantly working to improve how we steward water resources at the ranch. Our stewardship efforts include:

- Running a River Watch water monitoring program on Tomichi Creek.
- Engaging in wetland and stream restoration projects to improve the health of our conserved wetlands.
- Seeking ways to improve our water efficiency and to reduce water use during times of low flow.

Attachment B: Photos of Water Education at the Coldharbour Ranch

Senior Center Irrigation & Wetland Tour



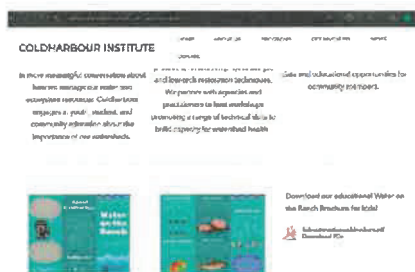
Water Resources and Wetland Restoration Tour at the Ranch



Workshops and Class Educational Outreach Opportunities



Screenshot of Coldharbour Institute Website with Materials



Attachment C: PEPO Task Narrative Budget Reporting

Task 1: Create Outreach Materials for Youth Program Participants

Coldharbour spent \$295.38 to print copies of water on the ranch brochures. This was less than anticipated in our original budget (we were able to find a discounted printing service). However, our staff spent more time compiling information on our water use (to use in staff presentations) and designed three different brochures to be used for outreach (targeting different ages and providing a Spanish option). Our Estimated Budget for Task 1 allocated \$600 for printing materials and \$500 (20 hours staff time) for staff to research, draft and design outreach materials and to research notes for outreach. Coldharbour staff ended up spending 46 hours creating presentations, two water brochures, and working to translate one into Spanish. To that end, Coldharbour is requesting the full estimated amount for task 1 but allocating more to staff time reimbursement than materials printing.

Request for reimbursement: \$1,100

- \$295.38 for printing
- \$804.62 for staff time

Task 2 Description: Use materials to engage visiting youth in water education.

Coldharbour engaged approximately 140 program participants directly in presentations about water use on the Coldharbour Ranch. Judging by the quality of discussion and questions coming from participants, these presentations appeared to increase participant understanding of water resources.

Coldharbour Institute contributed 48 hours of staff time to presentations and tours of the ranch centering around our water resources. We are requesting full reimbursement of \$400 for the 16 hours of this commitment requested in our proposal.

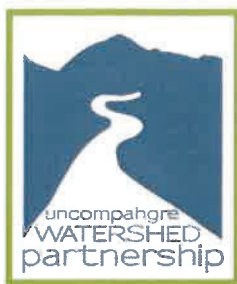
Request for reimbursement: \$400

Task 3: Website Update

Updating our website and engaging in outreach through social media was an in-kind task engaged in by Coldharbour Institute. There is no request for reimbursement here.

Request for reimbursement: \$0

Total request for reimbursement: \$1,500



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2024 GUNNISON RIVER BASIN ROUNDTABLE WATER EDUCATION GRANT FINAL REPORT FROM UNCOMPAHGRE WATERSHED PARTNERSHIP

The Uncompahgre Watershed Partnership thanks the Gunnison River Basin Roundtable for this Water Education Grant that allowed us to refresh the materials in our watershed educational supplies that are checked out by not only UWP volunteer educators but also teachers from area schools. The grant also allowed us to provide printed copies of teacher guides and student worksheets for our spring and fall school field trips, and make the lessons available to any teacher year-round on our website.

In this report, we have included a brief written report describing the outcomes of the funded activities (pages 1-2), photo documentation (pages 3-5), and a budget document recording expenses (page 6). In a separate document, we are submitting an invoice and receipts for all expenses.

With appreciation,

Tanya Ishikawa, Executive Director

Uncompahgre Watershed Partnership

tanya@uncompahgrewatershed.org

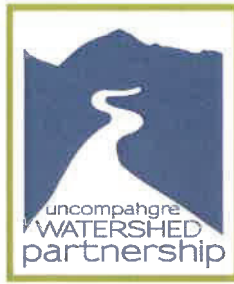
303-819-7784

Project Title: Education Supply Trunk Replenishment

In 2024, for the second year, the Uncompahgre Watershed Partnership (UWP) helped organize and lead the educational curriculum development and implementation for the Ridgway Middle School (grades 6-8) Watershed Week, a Ridgway High School (11th grade) science class field trip, and a combined Ridgway and Ouray High School science class field trip. The 2024 curriculum for the middle school week explored dams/reservoirs, fish habitat and biology, and fishing, while the high school trips focused on geology, hydrology, botany, and wetlands science.

These were supported by the enhancement of UWP's watershed education trunks with indoor and outdoor lab supplies and the production of the pdf version and [webpages of the Educator's Guide](#) for Teaching Students About the Upper Uncompahgre River Watershed:

<https://www.uncompahgrewatershed.org/educators-guide/>. This guide includes the middle school curriculum from 2024 as well as middle school curriculum developed in 2023, both of which can be modified by teachers to provide education to elementary and high school students. In fact, three elementary schoolteachers used supplies from the education trunk for their lessons in spring 2024.



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Approximately 80 students, 13 school teachers, and 8 volunteers and professionals from UWP, Ridgway State Park, Gunnison Gorge Anglers, and the community participated in the 2024 watershed education events. Another 54 to 75 students were taught with materials from UWP's watershed education trunk, bringing the total number of students benefiting from this grant to more than 134. Many more teachers and students are expected to benefit from the watershed education trunk and educator's guide in years to come. Not only can teachers and any interested person view the Educator's Guide online and download and print the lessons and worksheets, but UWP Education Working Group Chair Mary Menz will also help the middle school organize a third year of curriculum for the spring 2025 Watershed Week.

Task 1 Accomplishments- Supplies: Purchased three sets of supplies (eye droppers, pH strips, and dissolved oxygen test kits) for the watershed education trunk. Teachers used supplies during field trips and in-school lessons, plus supplies are still available for future years.

Task 2 Accomplishments- Copies: Created worksheets and teacher's guides for middle and high school lessons and printed copies that were used during spring and fall field trips and classes. Also, produced laminated sheets that are reuseable and were used this year as well as being available for future years in the trunk.

Task 3 Accomplishments- Web pages: Uploaded the Educator's Guide pdf to the UWP website, making it accessible to view, download and print for free year-round. Developed webpages for all content in the guide so the information can be searchable online and available for viewing in a fully digital format.

Task 4 Accomplishments- Grant administration: Tracked grant expenses and deliverables, collected photos and information about project outcomes, and created a final grant report with an invoice for reimbursements, plus a presentation will be given at the Jan. 20 GRBRT board meeting.

UWP leveraged GRBRT's Water Education Grant by securing the in-kind services of education and science experts to help teach during the field trips. In particular, UWP Board Member Mary Menz donated nearly 100 volunteer hours in helping organize the trips and lessons, develop the curricula, teach during the field trips, and write and produce the Educator's Guide. The value of her work alone is estimated at \$3,000 to \$6,000 depending on how you calculate the value of the volunteer hours.

UWP also recognized the Gunnison River Basin Roundtable for its support in the introduction to the Educator's Guide and UWP's [partners page](#), and will recognize GRBRT in the 2024 UWP Annual Report and in the announcements about the Educator's Guide release in January-February 2025.



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Ridgway Middle
School Watershed
Week, April 2024





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Ridgway High School
Science Field Trip,
August 2024





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Ridgway and Ouray High Schools
Geology Field trip, Sept. 2024





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Budget (Total Funding Awarded: \$1,100)			
Task Description	Expense Purpose	Expense Amount	Reimbursement Request
Task 1: Acquire supplies (\$300 budget approved in grant award)	CHEMetrics: dissolved oxygen test kit supplies	\$167.10	
	Walmart: PH Test Strips	\$ 83.60	
	Amazon.com: Eye droppers		
		\$ 29.65	
Task 1 Total			\$ 280.35
Task 2: Get print outs (\$200 budget approved in grant award)	Ridgway Office & Mercantile: laminated copies for trunks	\$ 25.30	
	Ridgway Office & Mercantile: worksheets	\$ 37.80	
	Ridgway Office & Mercantile: worksheets	\$ 33.21	
	Ridgway Office & Mercantile: worksheets	\$ 48.00	
Task 2 Total			\$ 144.31
Task 3: Putting education materials online (\$400 budget approved in grant award)	BT Multimedia Communication Services	\$ 436.53	\$ 400.00
Task 4: Grant administration (\$200 budget approved in grant award)	Note: No invoice/receipt attached for this amount, as grant report was completed on Dec. 5 and the grant presentation is scheduled for Jan. 20. The total amount of grant administration throughout the grant period and for making the presentation is an estimated 7 hours x \$46/hour = \$322	\$ 322.00	\$ 200.00
		Grant Total =	\$ 1,024.66

Upper Gunnison River Water Conservancy District
Request for Payment
PEPO Education Grants

Date: 11/30/24

Project Name: *Enhancing Water Literacy in a Rural Colorado River Basin Community.*

UGRWCD Contract Number: UG2024-025

Reimbursement Request Amount: \$ 1,116.97

Contact Name: Check Payable To: Hinsdale County School District

Contact Phone: Check Address:

614 N. Silver St.

P.O. Box 39

Lake City, CO 81235

Contact Email: elisaloper@gmail.com

PROJECT DELIVERABLES:

- Project completion report including a description of project, expense documentation, and photographs of work associated with the project (please include brief description of what we are seeing with each photo)

Report Provided in Separate Document

Difficulties Encountered/Corrective Action:

- Problem(s) / Changes: *While some of the project timelines were different than anticipated, we did not have significant problems during the project.*

- Resolution / Corrective Action:

With timeline changes, we simply adjusted the time required for completion.

By submittal of this reimbursement request and supporting documentation of expenditures, Applicant attests to the Upper Gunnison River Water Conservancy District that all items listed under *Project Deliverables* have been completed, all amounts due and payable for the Funded Work have been paid or, alternatively will be paid with the funds advanced by the District in response to this Request for Payment, and that all work done on the Funded Work has been completed in a good and workmanlike manner.

Applicant/Payee Signature & Date: *Elisa Loper* 11/30/24

Upper Gunnison Project Manager Signature & Date: *Beverly Richards* 11/30/24

Dear Gunnison River Basin Roundtable Members,

Thank you for your support of Lake City Community School's STEM project, *"Enhancing Water Literacy in a Rural Colorado River Basin Community."* With your help, we developed and delivered a curriculum that enriched our students' understanding of the importance and value of water as a vital resource in their lives and community. We connected key science concepts to real-world applications in a way that has been both educational and engaging for the elementary students at Lake City Community School.

Below you will find a summary of the project, key outcomes and photos, and a financial summary with our itemized purchases and receipts.

Warmly,

Elisa Loper

STEM Teacher, Lake City Community School

Project Description

The objective of our project was to design and implement new STEM units at Lake City Community School that enhance water education for elementary classrooms. Through a series of engaging lessons and hands-on activities, we provided a comprehensive water education program emphasizing the importance of local water resources in our community and neighboring counties. These activities not only deepened students' understanding of water systems but also strengthened their problem-solving skills as they explored real-world challenges tied to STEM-related careers.

The outline below details the tasks and subtasks undertaken in this project, along with the grade levels where each subtask was implemented. These activities served as a foundation for practical learning experiences, fostering critical thinking and encouraging students to connect their classroom explorations to real-life applications in water conservation and management.

1. Task 1 Description: Investigating Water Conservation Techniques and Evaluating Water Quality.

- a. Subtask 1A: What is the Water Cycle? (Grades K-3)
- b. Subtask 1B: What is the Distribution of Freshwater on Earth? (Grades 2-5)
- c. Subtask 1C: Learning about Desalination (Grades 4-5)

- d. Subtask 1D: Transporting Water (Grades 4-5)
- e. Subtask 1E: Building Water Filtration System (Grades K-5)
- f. Subtask 1F: Generation Genius Subscription to Aid Visual Learning (Grades K-5)
- 2. **Task 2 Description: Water's Role in Changing Landforms Unit.**
 - a. Subtask 2A: Weathering and Erosion Lessons (Grades 2-5)
 - b. Subtask 2B: Weathering and Erosion Hands-On Exploration (Grades 2-5)
 - c. **Task 3 Description: Water's Vital Role in Supporting Life and The Role of the Hydrosphere.**
 - d. Subtask 3A: Terrarium Building (Grades 4-5) **adapted from 2-5 to allow HS to lead
 - e. Subtask 3B: Plant Growing Observations Over Time (Grades K-1)
- 3. **Task 4 Description: Float Your Boat Unit.**
 - a. Subtask 4A: Sink or Float Experiment. (Grades K-3)
 - b. Subtask 4B: Boat Design and Construction (Grades K-5)

Results and Impact

Task 1 Description: Investigating Water Conservation Techniques and Evaluating Water Quality

Through this unit, students conducted investigations and made real-world connections in small groups to learn about water-related topics, including the Water Cycle, Distribution of Freshwater on Earth, Desalination, Transporting Water, and Building a Water Filtration System. Each subtask is directly aligned with 4th and 5th-grade state learning standards, with subtasks on the Water Cycle and Water Filtration also applicable to K-5 learners.

Subtask 1A: Water Cycle

This learning investigation successfully expanded an existing water cycle unit for grades K-3. Students demonstrated an increased understanding of the water cycle through visual models and discussions.

Subtask 1B: Distribution of Freshwater on Earth

The learning activities were so impactful for 4th and 5th graders that the unit was adapted for 2nd and 3rd grades as well. For older students, the use of Google Sheets to graph and analyze data introduced a new technological skill, which many had not previously practiced. This activity highlighted the importance of representing data visually and interpreting results. For younger students, the water map sparked discussions about estimation, an unplanned but valuable addition to the learning experience. The activities also served as excellent cross-curricular resources to help students put mathematical skills into practice.



In the above photo, students are using a water map, learning sheet, and beakers to learn about how much freshwater exists on our planet.

Subtask 1C: Desalination

The desalination activities were among the most engaging parts of the project. Students' curiosity about why ocean water isn't a primary drinking source across the globe lead to discussions and critical thinking about the challenges of desalination.

Subtask 1D: Transporting Water

The purchased activity provided a highly engaging and hands-on experience. Students faced the challenge of transporting water 24 inches using a free-standing system, which prompted questions about why water can't simply be "dropped" into a container. This question led to meaningful connections between the activity and real-world systems in towns and cities, helping students understand the complexity of water transport infrastructure and why we often need to solve complex problems to deliver water to its users.



In the above photos, three student groups have developed three solutions to deliver water 24 inches and into a container.

Subtask 1E: Build a Water Filtration System

Students built water filtration systems, demonstrating their ability to create devices that solve specific problems. This task supported practical learning about water quality, conservation, and treatment in both backcountry and urban settings.

Subtask 1F: Generation Genius Subscription

Generation Genius proved to be an invaluable tool for presenting information in diverse modalities. Its videos, activity guides, and other resources supported learning across multiple subtasks. A standout example was a dry ice and sand demonstration, which simulated interactions between the hydrosphere, atmosphere and geosphere. This demonstration, tied to real-life processes observed at Blue Mesa Reservoir, provided a powerful visual learning moment that would have been difficult to replicate otherwise.



The above photo is a visual representation of the interaction between the hydrosphere, atmosphere, and geosphere. Photo from [generationgenius.com](https://www.generationgenius.com)

Task 2 Description: Water's Role in Changing Landforms Unit

Through this unit, students learned about water's role in changing the Earth's landscape over time through weathering and erosion. This unit successfully built on prior STEM lessons about our local watershed and the rock cycle, developed in partnership with Lake Fork Valley Conservancy. Originally designed for 4th and 5th graders, the activities were extended to include 2nd and 3rd graders due to their alignment with general classroom science lessons. Hands-on activities helped reinforce key concepts across grade levels.

Subtask 2A: Weathering and Erosion Lessons

Students practiced key vocabulary by reading real-world connection cards aloud to their peers. A Vocabulary Bingo game provided an engaging way to reinforce the terms and their meanings, ensuring students understood how weathering and erosion relate to their environment.



In the above photo, a student is reviewing slow and fast event task cards.

Subtask 2B: Weathering and Erosion Hands-On Exploration

Students explored the differences between fast and slow changes to the Earth's surface through hands-on investigations. Using cornstarch and water, they modeled these changes, which helped them visualize the effects of weathering and erosion. Discussions during the activity highlighted local examples, such as the Slumgullion watershed, connecting their learning to the surrounding community.



In the above photo, a student is testing a slow event after reviewing slow and fast event learning cards.

Task 3 Description: Water's Vital Role in Supporting Life and The Role of the Hydrosphere

In this unit, upper elementary students engaged in hands-on activities to deepen their understanding of the essential role water plays in supporting life on Earth, with a specific focus on the hydrosphere. Kindergarten and first grade students explored water's role in supporting plant life. Through two subtasks, students built terrariums to investigate the hydrosphere's role and used plant growing kits to observe the connection between water and life.

Subtask 3A: Terrarium Building

Students in 4th and 5th grade constructed terrariums to explore the hydrosphere's role in sustaining life. To support student-led learning, we modified the scope to include only 4th and 5th graders, providing one-to-one access to materials and logistically accommodating a guest teacher. A high school student with expertise in terrarium building led the lesson and guided the students through the construction process and answered questions students had about why each material was used to support terrarium growth. Students took their terrariums home to continue their observations and share their learning with their families. At school, the class observed the growth of chia and wheatgrass seeds over several weeks.



In the photos above, a student is admiring her completed terrarium (left). The 4th and 5th students are asking the 10th grade guest teacher questions about terrarium construction (right).

Subtask 3B: Window Plant Growing Kit

Kindergarten and first grade students used window plant growing kits to investigate the fundamental role of water in supporting plant life. They observed and documented the growth of radish plants over a period of four weeks, gaining a hands-on understanding of how water nourishes plants.

Task 4 Description: Float Your Boat Unit

Students explored the concept of density and its impact on whether objects sink or float in water. Through hands-on experiments, they investigated factors that determine buoyancy and applied their understanding in a boat-building project, culminating in a race down a local drainage from Henson Creek.

Subtask 4A: Sink or Float Experiment

Students investigated the properties of various objects and substances, predicted whether they would sink or float, and recorded the results.

Subtask 4B: Boat Design and Construction

Students designed and constructed boat prototypes in STEM class, applying density and buoyancy principles. Then, in collaboration with the school's art teacher, students incorporated

artistic elements into the design process, while engineering the boats to float down a local drainage from Henson Creek. This popular event was an educational and fun culmination of learning!



In the above photos, students are testing their boat prototypes for buoyancy (right), and racing their boats in a Henson Creek drainage system for the final race (middle, right).

Financial Summary

Below is the financial summary of the items we purchased for this project.

Itemized Items	Total Amount: \$1,116.97
1. Water Conservation Investigation Kits (3) and Water's Changing Role in Landforms Kits (3)	\$334.94
2. Terrarium Classroom Kits	\$170.30
3. Generation Genius Subscription	\$225
4. Plant Growing Kits (2)	\$27.29
5. Build a Water Filtration System Kits	\$322.81
6. Float Your Boat Materials	\$36.63

Appendix: Receipts

#1: Water Learning Kits

UGRWCD Delta County School District 50J Funding Agreement
Page 4 of 4 Pages

Exhibit B

UGRWCD Delta County School District 50J Funding Agreement
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Upper Gunnison River Water Conservancy District
Request for Payment
PEPO Education Grants

Date: 11/30/2024

Project Name: Paonia K8 Ecology Gunnison Basin

UGRWCD Contract Number: UG2024-021

Reimbursement Request Amount: \$ 1,015.63

Contact Name: Check Payable To: Delta County School District

Contact Phone: Check Address: 145 W. 4th Street, Delta, CO 81416

Contact Email: sam.cox@deltaschools.com

PROJECT DELIVERABLES:

- Project completion report including a description of project, expense documentation, and photographs of work associated with the project (please include brief description of what we are seeing with each photo)

Difficulties Encountered/Corrective Action:

- Problem(s) / Changes: Please see the attached document titled Paonia K8 Aquatic Ecology GB Report
- Resolution / Corrective Action: Please see the attached document titled Paonia K8 Aquatic Ecology GB Report

By submittal of this reimbursement request and supporting documentation of expenditures, Applicant attests to the Upper Gunnison River Water Conservancy District that all items listed under *Project Deliverables* have been completed, all amounts due and payable for the Funded Work have been paid or, alternatively will be paid with the funds advanced by the District in response to this Request for Payment, and that all work done on the Funded Work has been completed in a good and workmanlike manner.

Applicant/Payee Signature & Date:  11/30/24

Upper Gunnison Project Manager Signature & Date:  11/30/24

Paonia K8 Aquatic Ecology GB Report

Project Report:

On October 8th and 9th, 47 students from Paonia K8 and 8 adult chaperones joined three volunteers from the Forest Service and collected macroinvertebrate samples, chemical tests and general observations about water quality of the rivers in the Upper Gunnison River drainage at at Horse Ranch Park, Erickson Springs, and Kebler Corner at the confluence of the Anthracite and Muddy. We compared this data with samples collected from the North Fork of the Gunnison on Paonia K8's campus. Students created stream health reports for each of the stream segments and identified bank erosion and sedimentation as two significant issues facing water quality in this part of the watershed.

Students also learned about the diversion of water from the river for irrigation purposes and the importance of the system of canals and ditches in our local watershed which support our local agricultural economy. The financial grant support we received from the Upper Gunnison River Water Conservancy helped fund transportation, food, and camping supplies for students on the trip as we camped along the way.



A student lab group collects macroinvertebrate samples from the Anthracite River near the confluence with the Muddy.

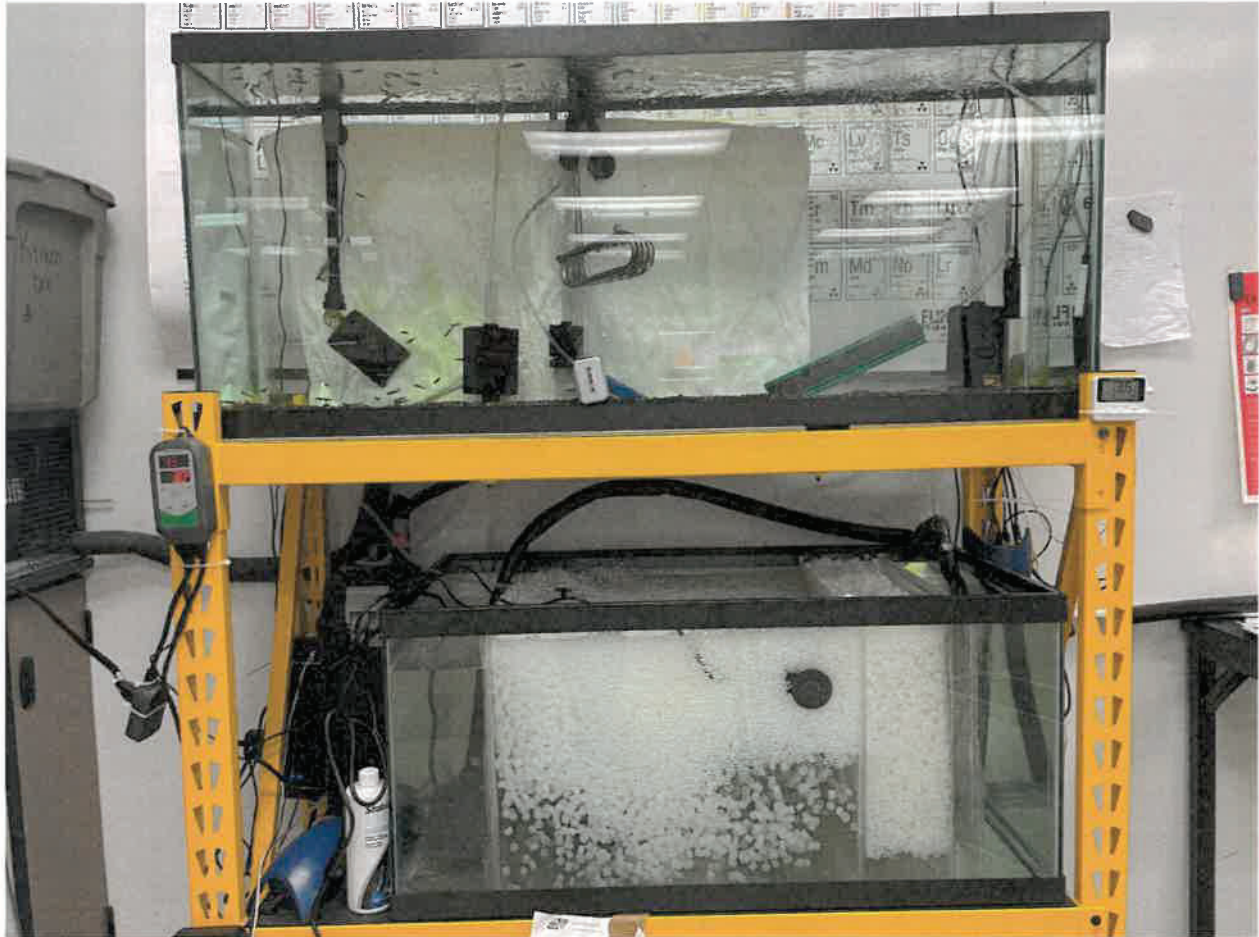
Paonia K8 Aquatic Ecology GB Report



A student lab group collects Macroinvertebrate samples from the Ruby Anthracite in Horse Ranch Park.

Finally, purchase of materials for a student-designed biological filter for the treatment of nitrogenous waste from our Trout in the Classroom Tank allowed students to learn deeply about the nitrogen cycle as it relates to plant growth and water quality.

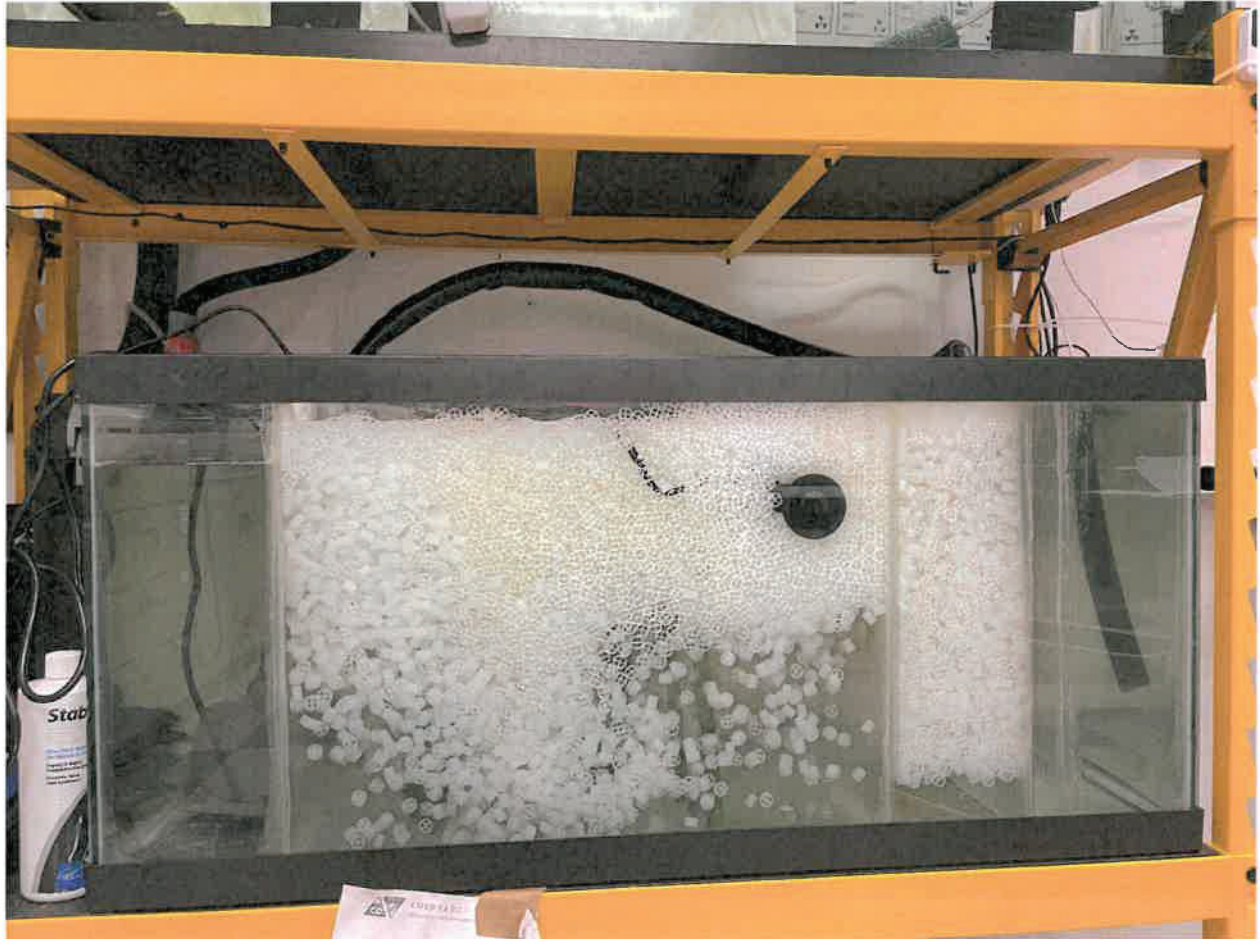
Paonia K8 Aquatic Ecology GB Report



Here we see the Filter below the Trout in the Classroom Aquarium.. The chambers are

Paonia K8 Aquatic Ecology GB Report

described more clearly in the image below.



The student-designed biological filter with reaction chambers described from right to left (direction of flow) Chamber 1: Collection and mechanical filtration. Chamber 2 (Hypoxic denitrification): water flows across the surface. Plastic noodles provide large surface area for denitrifying bacteria to grow. Chamber 3: Main Chamber - moving bed filter houses nitrosomonas and nitrospira which convert toxic ammonia from fish waste into

Problem:

Science teacher's spouse had some medical needs crop up which lead to the cancellation of the day trip to the Eagle Rock Shelter and confluence of the Gunnison and North Fork. These funds were not spent.

Resolution:

The water sampling at the confluence of the North Fork and Gunnison was cancelled, and the project was amended to only include samples taken from waterways upstream of the confluence.

PEPO Report

How's The River is designed to deliver the river to youth and hopefully youth to the river. The mission of the club is to produce a site that viewers will go to when they want to learn something about watersheds. We hope to provide valuable content for all viewers from avid anglers to the San Juan bookworms.

We are dedicated to sharing the river with others. We would like to share our love of the river with others and most importantly cultivate the future generations of riparian lovers.

Our vision was born from the Foxfire series put together by Eliot Wigginton, who is known as a writer, folklorist, and true historian. He found himself as a new high-school teacher in a troubled classroom that held no hope. He realized that he would either have to find another place to teach or would have to find another way to reach the students. He chose the latter and Foxfire was born. A quote from the introduction of the book, where you will find his own story and the beginning of Foxfire, speaks a lesson to homesteaders: "Those who cannot remember the past not only relive it; they tend to impose it, mistakes and all, on others."

Foxfire began as a magazine written by Wigginton's high school students. It was his way of trying to reach and "save" his own students.

Our club is designed to reach and "save" our students who love the outdoors and need a boost getting excited about the academics.

I have seen how much the students care about their local river increase during our first semester and with our constant efforts to upgrade our equipment we are able to collect and explore river water with much more comfort and warmth.

Next set of pictures will have waders.

