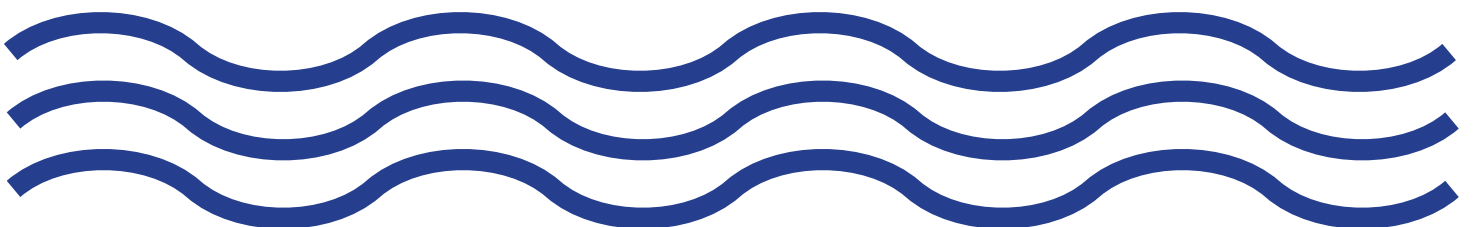




CLEAN WATER UNIVERSITY

*Adventures in stormwater,
drinking water, and wastewater.*

2022-2023 Teachers' Guide



Introduction & Table of Contents

Welcome to Clean Water University, Virtual Edition!

Welcome to the Clean Water University (CWU) Teachers' Guide for the 2022-2023 school year! The [City of Springfield](#), [City of Eugene](#), and [Metropolitan Wastewater Management Commission \(MWMC\)](#) are proud to offer this program to 5th grade classes in the Eugene-Springfield area free of charge. This guide can be used as prep for attending the in-person field trip if your school enters the selection lottery and is selected, or if your school is not selected or can't due to school policies, but want to participate in the online version. The overarching goal of the program remains the same regardless of attending the in-person field trip or participate in the virtual offering: to teach students about the importance of clean water.

This Teachers' Guide is to make CWU as easy to implement into your existing lesson plans as possible. Outlined below and on the following pages, you'll find curriculum on a variety of topics pertaining to clean water with links to videos, activities, and worksheets on the City of Springfield's website. Move through them at whatever pace works best for you and your virtual classroom. Thank you for your participation and enjoy!

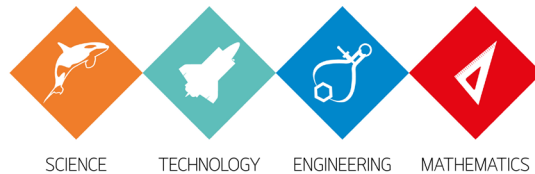
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Incentive Information

School STEM Program Donation

As a thank you for incorporating Clean Water University into your curriculum and to further science, technology, engineering, and math education in the Eugene-Springfield area, the MWMC will donate \$500 to each participating school's STEM program. To ensure this funding is sent to your school, simply confirm participation in Clean Water University with Loralyn Spiro, City of Springfield/MWMC Communications Supervisor, at lspiro@springfield-or.gov. The MWMC will then coordinate with your school district's Finance Department to send those funds to your specific school and designate them for your STEM program. If your school doesn't have an official STEM program, the donation can go toward your science curriculum supplies, such as microscopes or other equipment.



STEM Education

Class Drawing: Eugene Science Center Memberships

In addition to the school STEM program donation, participating classes will be entered into a drawing for all students in the winning class to receive a membership to the Eugene Science Center for one adult and one child (a \$50 value!). This will give the students and a parent/guardian free admission to Eugene Science Center exhibits and to Planetarium stargazing shows for an entire year! Memberships also include discounts on a variety of the Science Center's other offerings. To learn more, visit <https://eugencesciencecenter.org/support/membership>.

To enter your class in the drawing, submit proof of your class's participation (can be a student's Micro Story Assignment, a screenshot of you leading your class in a game of Jeopardy, etc.) to lspiro@springfield-or.gov. The winning class will be announced in May 2023, and the teacher will then receive instructions for distributing the memberships to students/parents. Good luck!



Lesson 1: Water Cycle

Overview & Key Learning Outcomes

In this lesson, students will be introduced to the water cycle and learn about the continuous movement of water on, above, and below the surface of the earth. They'll learn about the various phases of the water cycle, including evaporation, condensation, precipitation, and absorption.

By the end of the lesson, students will be able to:

- Explain where water comes from.
- Identify the various stages of the water cycle.
- Recognize water as an essential resource.

Key Words

Water Cycle
Water Droplet
Water Vapor
Surface Water
Evaporation
Condensation
Precipitation
Runoff
Absorption
Aquifer

Teaching Points

- Water is essential to all life. Without it, humans, animals, and plants couldn't survive.
- All water moves continuously and is recycled over and over again. The same water we use today has been here for billions of years - that means the water you drink could be the same water thirsty dinosaurs were drinking 65 million years ago! It's also the only water we'll ever have in the future.
- While water hasn't changed much over billions of years, what does change is the stage of the water cycle that it's in. The four main stages of the water cycle are evaporation, condensation, precipitation, and runoff.

Procedures/Materials

1. Start by asking students where they think their water comes from when they take a bath or shower, wash their hands, or do the dishes.
2. Play the [Water and You: The Water Cycle video from American Water on YouTube](#) to give students an overview of the water cycle.
3. Take a look at the [Water Cycle Diagram handout from the U.S. Geological Survey](#) together as a class. Identify the various stages of the water cycle that were explained in the video.
4. To close the lesson, have students complete the [Water Cycle Word Search](#).



Graphic Credit: Vecteezy.com

Lesson 2: Drinking Water

Overview & Key Learning Outcomes

In this lesson, students will learn where their drinking water comes from, how it's cleaned, and the tools used to transport the water to the faucets in their homes. They'll be introduced to the various steps in the process of cleaning drinking water to ensure high water quality.

By the end of the lesson, students will be able to:

- Explain how drinking water gets to their home.
- Identify various sources of drinking water.
- Recognize that water must be properly cleaned to rid it of pollutants before it can become drinking water.

Key Words

Drinking Water
Water Quality
Fresh Water
Ground Water
Aquifer
Flocculation
Clarification
Filtration
Disinfection
Chlorine
Ozone
Pipes
Pumps

Teaching Points

- All humans and animals must consume water in order to survive. On average, 9-13 year olds should drink about 7-9 cups of water per day to stay hydrated.
- Though 71% of earth's surface is water, only 0.3% of that water is usable by humans. The other 99.7% is in the oceans, soils, icecaps, and floating in the atmosphere. That's why it's important that we take good care of the fresh water that we can use!
- Most of the water used by humans comes from rivers and aquifers, or water stored underground.
- In Eugene, drinking water comes from the McKenzie River. In Springfield, drinking water comes from a large aquifer under the City and from the Middle Fork Willamette River.
- Before water from these sources can become drinking water, it has to be cleaned to remove bacteria, viruses, and micro-pollutants. Then water quality tests are conducted to make sure the water is safe to drink.
- In Eugene and Springfield, the two organizations that clean our drinking water are the Eugene Water & Electric Board (EWEB) and Springfield Utility Board (SUB). They do such a good job that what comes out of our faucets is often even cleaner than what the State of Oregon and U.S. government require!
- After it's treated, drinking water is transported to homes and businesses through a system of pumps and underground pipes throughout the region.

Procedures/Materials

1. Ask students where they think their drinking water comes from and how it gets to the faucets in their home.
2. Play the [Water and You: The Drinking Water Treatment Process video from American Water on YouTube](#) to introduce students to the sources of drinking water and the process of cleaning it.
3. Have students complete the [Drinking Water Word Search](#) to become more familiar with key words associated with the drinking water treatment process and pollutants that can affect our water sources.
4. If time allows, visit either the Eugene Water & Electric Board or Springfield Utility Board website at [eweb.org](#) or [subutil.com](#) to learn more their treatment processes and water quality standards.

Lesson 3: Water Quality

Overview & Key Learning Outcomes

In this lesson, students will learn about the various measures that affect the quality of water in our rivers and streams. They'll also learn about stormwater runoff and how it can impact that water quality.

By the end of the lesson, students will be able to:

- Identify the key measures that help us determine the health of a river, stream, or lake.
- Explain why high levels of water quality are important to human and animal life.
- Recognize the role stormwater plays in the quality of our local waterways.

Key Words

Water Quality
Water Testing
Laboratory
Turbidity
Dissolved Oxygen
Phosphates
Nitrates
Temperature
pH
Stormwater
Runoff

Teaching Points

- Water is essential to human, animal, and plant life. As we learned in the previous lesson, only 0.3% of the earth's water is usable by humans, and most of the fresh water we can use above the ground comes from rivers and streams. That's why it's important that we take good care of our rivers and maintain high water quality for human use, outdoor recreation, and aquatic life.
- Some of the key measures that help determine water quality are turbidity, dissolved oxygen, nutrients, temperature, and pH. More on each of these points is covered in the [Water Quality Lecture Notes document](#).
- Stormwater is water that falls to earth's surface as rain or snow. We get quite a bit of rain here in the Eugene-Springfield area - about 47 inches per year! When it rains, that water flows over streets, rooftops, driveways, and lawns as runoff. Runoff flows into storm drains, which connect to local waterways that eventually lead to the McKenzie and Willamette Rivers.
- As the runoff flows across the ground, it picks up pollutants from things like litter, fertilizers, fluids used to maintain cars, and pet waste. Since stormwater isn't treated the way drinking water and wastewater are, these pollutants can end up in our local waterways. It's important we keep pollutant levels in stormwater runoff to a minimum.
- There are some simple actions community members like you and your family can take to help us keep our water clean from street to stream! These include scooping your pet's poop, picking up litter, avoiding use of certain chemicals and fertilizers, and fixing leaking cars.

Procedures/Materials

1. Go over the water quality measures defined in the [Water Quality Lecture Notes document](#).
2. Have students complete the [Water Quality Prep Worksheet](#), where they'll answer questions based on defined key words at the top of the page. Discuss the answers of the worksheet on the [Water Quality Prep Answer Key](#), explaining the turbidity, dissolved oxygen, phosphates, nitrates, temperature, and pH of the McKenzie River. Ask students how close their guesses about the McKenzie River were to the actual numbers.
3. Open the ["Only Rain Down the Drain" Interactive Game](#). Play together as a class, allowing for group discussion between each question before answering.
4. If time allows, visit the [City of Springfield](#) or [City of Eugene's](#) Stormwater webpages to learn more about what each of the cities do to protect our local waterways.

Lesson 4: Macroinvertebrates

Overview & Key Learning Outcomes

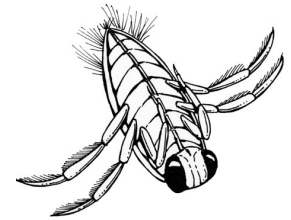
In this lesson, students will learn about aquatic macroinvertebrates, their place in the food web, and the importance of clean water to their survival - and ultimately the survival of their predators. They'll learn about the different bugs prevalent in our area's waterways.

By the end of the lesson, students will be able to:

- Define a macroinvertebrate and recognize their important role in the food web.
- Explain the connection between clean water and the food web.
- Identify some common macroinvertebrates such as mayflies, dragonflies, and aquatic earthworms.

Key Words

Aquatic
Macroinvertebrate
Metamorphosis
Larva
Nymph
Life Cycle
Food Web



Teaching Points

- Aquatic macroinvertebrates are water bugs (aquatic) that are visible to the naked eye (macro) and don't have a spine (invertebrates). These insects are an important part of the food web in our area's waterways. They are prey to fish, frogs, and other aquatic animals.
- Some examples of macroinvertebrates are mayflies, dragonflies, damselflies, scud, aquatic earthworms, aquatic beetles, snails, water boatman, backswimmers, and caddisflies. (Each of these insects is shown in detail in the [Macros Guide document](#).)
- Just like us, macroinvertebrates require clean water to survive. No clean water would mean no macroinvertebrates, which in turn would mean trouble for the fish and frogs that eat macroinvertebrates. All living things require water, and a lack of clean water can disrupt the food web.
- In order to protect macroinvertebrates and the food web in our local waterways, it's important to take good care of our rivers and streams.

Procedures/Materials

1. Ask students if they have spotted any insects near the Willamette or McKenzie Rivers and if they know what kinds of insects they have seen.
2. Play the [CWU: Macroinvertebrates video](#) to give students an overview of these bugs, where they're found, and why they're important to our local environment.
3. Open the [CWU Macros Guide document](#) and go through the photos of each of the macroinvertebrates. Have students refer to their [Macroinvertebrates Overview handout](#) and discuss the life cycle of a mayfly. Ask students if, after watching the video and viewing close-up images of these bugs, they now recognize insects they've seen near the Willamette or McKenzie Rivers.
4. Have students access their printed [Aquatic Life in our Local Waterways Coloring Books](#) and color in outlines of the different macros. If time allows, ask for volunteers to share their favorite colored-in bug and present one fact they learned during today's lesson.

Lesson 5: Wastewater Treatment

Overview & Key Learning Outcomes

In this lesson, students will learn about where their dirty water goes after they flush the toilet, wash the dishes, or take a shower. They'll learn about the underground pipe system that takes water from their home to the Regional Wastewater Treatment Plant, the steps that are taken to clean wastewater, and that all cleaned water is returned to the Willamette River.

By the end of the lesson, students will be able to:

- Explain where their wastewater goes to be cleaned.
- Explain why effectively cleaning wastewater helps to protect our community's health and local environment.
- Identify the key steps in the wastewater treatment process.

Key Words

Wastewater
Treatment Plant
Pump Station
Pipes
Influent
Effluent
Clarifiers
Aeration Basins
Disinfection
Laboratory Testing

Teaching Points

- As wastewater goes down the drain, it enters into a system of pipes underground. Large pumps help to move the wastewater through the pipes to the Metropolitan Wastewater Management Commission's, or MWMC's, Wastewater Treatment Plant. The MWMC is a partnership of the Cities of Eugene and Springfield, along with Lane County, and cleans wastewater for the whole region - about 35 million gallons of it every day (that's 106 Olympic-size pools)!
- Once wastewater arrives at the treatment plant, it goes through a series of different treatment processes over about 24 hours before it is ultimately returned to the Willamette River. The three main stages of wastewater treatment are physical, biological, and chemical. The different treatment processes we use remove large and small solids from the wastewater, along with bacteria and other pollutants. We'll learn more about those different processes in the [Wastewater Treatment video](#).
- Cleaning water thoroughly is very important in keeping our community safe, while also protecting our local environment. The Willamette River is a popular spot for activities like kayaking and swimming. We want to keep it clean so people in the community can continue to enjoy our beautiful river. Additionally, aquatic life needs clean water to survive! By cleaning wastewater, we're helping to protect a variety of animals in the food web. Water is a limited resource and cleaning dirty water ensures we aren't wasting it.

Procedures/Materials

1. Play the [MWMC Wastewater Treatment video](#) to give students an overview of the process.
2. Have students access their [Wastewater Treatment Process Maze](#) handout and complete the maze to connect the water droplet to the river.
3. Play a game of Wastewater Bingo using the [MWMC Bingo boards](#). Distribute a Wastewater Bingo Board to each student (boards will need to be printed and cut). Every card has the same 24 phrases, just in a different order. Using the [Questions & Answers sheet](#), read the description for each and have students mark out the answer on their board. Prior to moving on to the next description, ask for volunteers to share the correct answer. The first person(s) to mark off five phrases in a row, horizontally, vertically, or diagonally, wins.
4. Have students access their [Wastewater Wise worksheet](#). Explain that students will track their water usage over a 24-hour period to see just how much water they use. They'll then brainstorm three ways they could reduce their water usage. Have the class reconvene a few days later and discuss the ideas they came up with.

Lesson 6: Microorganisms

Overview & Key Learning Outcomes

In this lesson, students will learn about the good bacteria, or microorganisms, that play a key role in the wastewater treatment process. They'll learn how these small bugs make a big impact in the overall biological health of wastewater.

By the end of the lesson, students will be able to:

- Define a microorganism.
- Explain the role microorganisms play in the wastewater treatment process.
- Identify some of the common microorganisms present in the biological treatment of wastewater.

Key Words

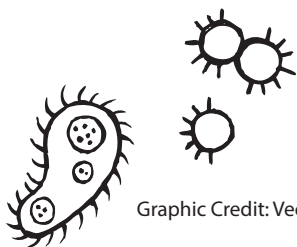
Microorganism
Good Bacteria
Biological Treatment
Aeration Basins
Secondary Clarifiers
Oxidation
Organic Matter

Teaching Points

- Microorganisms are organisms that are so small they can only be seen with a microscope.
- Microorganisms play an important role in the biological treatment of wastewater at the Wastewater Treatment Plant. The good bacteria, or good bugs as we like to call them, are mixed with incoming wastewater in the aeration basins. They're called aeration basins because we pump air, or oxygen, into the basins through a process called oxidation. If a person tried to swim in an aeration basin, they couldn't because there is so much air they would sink to the bottom! Adding this oxygen into the water helps to break down any remaining solids, or pollutants, in the water.
- As the pollutants remaining in the water are breaking down, the microorganisms eat them out of the water. These good bugs get fat and heavy, settling to the bottom of the secondary clarifiers to take a quick rest before they go back into the aeration basins to eat more solids.
- The ideal age for bacteria in the aeration basins is five days. The presence of the right amount of microorganisms is an important indicator that the wastewater is being properly treated.

Procedures/Materials

1. Play the [CWU: Microorganisms video](#) to give students an overview of the role microorganisms play in the wastewater treatment process.
2. Open the [CWU Microorganisms Field Guide document](#) and show students the photos illustrating each of the micros. Zoom in on each of the magnifying glasses in the document to take a closer look at examples of protozoa, bacteria, and metazoa.
3. Leaving the Microorganisms Field Guide document open, have students access their [Tell a Micro Story worksheet](#). For this activity, they'll select a micro from the document, give it a name, draw a picture of it, and tell their micro's story. If time allows, have volunteers share their work.



Graphic Credit: Vecteezy.com

Lesson 7: Pollution Prevention

Overview & Key Learning Outcomes

In this lesson, students will learn about the pollutants that can affect our wastewater collection system, Wastewater Treatment Plant, and ultimately, our local waterways. They'll learn about everyday actions they can take to make a difference in the pollution prevention effort.

By the end of the lesson, students will be able to:

- Recognize the importance of preventing pollution from entering the wastewater collection system.
- Identify actions that community members can take to prevent pollution, such as keeping trash out of the toilet.
- Explain what happens to pollutants when they are flushed/poured down the drain.

Key Words

Pollution
FOG (Fats, Oils, & Grease)
Toilet
"Flushable" Wipes
Pipes
Clog
Backups
Waste
Environment
Source Reduction

Teaching Points

- About 99.9% of what comes into the Wastewater Treatment Plant is water and 0.1% is pollutants. The MWMC's treatment processes remove more than 97.5% of solids. The best way to remove pollutants from water though is to prevent them from entering the wastewater system in the first place! That's what we refer to as source reduction, or reducing pollutants at the source (toilet, drain, etc.).
- Some common pollutants that we have to physically remove from wastewater at the treatment plant are fats, oils, grease, "flushable" wipes, baby wipes, paper towels, car fluids, fertilizers, paints, medications, plastics, and hygiene products. After solids are removed from wastewater, they are ground up and then taken over to the landfill. Since these materials will end up having to be trashed anyway, it's best to dispose of them properly rather than send them down the drain.
- Fats, oils, and grease can cause a lot of issues if poured down the drain for both families and the entire community. These materials harden in wastewater pipes and can cause clogs, which are often expensive to fix. Instead of pouring fats, oils, and grease down the kitchen sink, try pouring them in a can, waiting until they harden, and then throwing the can away in the trash.
- Items like "flushable" wipes, baby wipes, and paper towels can also cause clogs in pipes. These items aren't designed to dissolve in water the way toilet paper is, so they can get stuck in pipes and pumps, leading to blockages and backups. Remember, the toilet is not a trash can! The only things that should be flushed are the three Ps - pee, poop, and (toilet) paper.
- Taking simple steps like these can make a big difference in protecting our local waterways.

Procedures/Materials

1. Play the [MWMC Pollution Prevention video](#) to give students an overview of the pollutants that often enter the wastewater collection system and the actions we can take to prevent them.
2. Have a class discussion about what students can do to prevent pollution based on the video.
3. Have students access the [Flush With Care handout](#), where they'll unscramble key words pertaining to pollution prevention.
4. If time allows, visit the [MWMC's Pollution Prevention webpage](#) to learn more.

Lesson 8: Sustainability

Overview & Key Learning Outcomes

In this lesson, students will learn about the Metropolitan Wastewater Management Commission's efforts to sustainably manage its resources, benefitting both the community it serves and the environment it protects. They'll learn about byproducts of the wastewater treatment process like biosolids and recycled water that are reused to help poplar trees on our Biocycle Farm grow.

By the end of the lesson, students will be able to:

- Explain the benefits of sustainability efforts in protecting our local environment.
- Identify the byproducts of the wastewater treatment process that the MWMC beneficially reuses: biosolids, recycled water, and renewable natural gas.
- Recognize that the Biocycle Farm uses waste to produce wood, a renewable resource for our community.

Key Words

Sustainability
Recycling
Beneficial Reuse
Natural Resources
Renewable
Non-Renewable
Byproduct
Recycled Water
Biosolids
Biocycle Farm
Poplar Tree
Renewable Natural Gas
Fossil Fuels
Waste

Teaching Points

- As we learned during our Wastewater Treatment lesson, the MWMC cleans water for the Eugene-Springfield area. They strive to do so in a sustainable way. Sustainability is the act of taking good care of the resources we have and reducing waste.
- One example of sustainability in action is the MWMC's use of biosolids on its poplar tree farm. Human waste is a natural part of everyday life, and it has to be removed from wastewater during the treatment process. Rather than trashing solids in the landfill, the MWMC transports them underground to the Biosolids Management Facility, where they're turned into a safe fertilizer.
- That fertilizer helps poplar trees on the MWMC's Biocycle Poplar Farm grow. It's also applied on grass farms to help local farmers. After the poplar trees grow for about 12 years, they're harvested and turned into plywood, wood chips, and other wood products that are sold in the community.
- The MWMC uses recycled water, or treated wastewater, to irrigate the poplar trees, along with landscaping at the treatment plant. This allows us to save our drinking water and recycle water we already have!
- Another example of the MWMC's sustainability efforts is the reuse of energy produced during the wastewater treatment process. The MWMC is currently working on an exciting project to convert this energy into renewable natural gas, which will be used as a clean fuel for cars. This will help to reduce the amount of gasoline we're using that's made from non-renewable, or limited, natural resources.

Procedures/Materials

1. Play the [MWMC Sustainability video](#) to give an overview of the MWMC's sustainability efforts.
2. Have students complete their [Waste to Wood worksheet](#), where they'll fill in missing key words using a word bank to tell the story of biosolids and recycled water being used on the poplar farm. Go over the answers on the [Waste to Wood Answer Key](#).
3. Ask students what sustainability means to them and what ideas they have for reducing waste.
4. If time allows, visit the MWMC's [Biosolids Management Facility](#) and [Biocycle Farm](#) webpages.

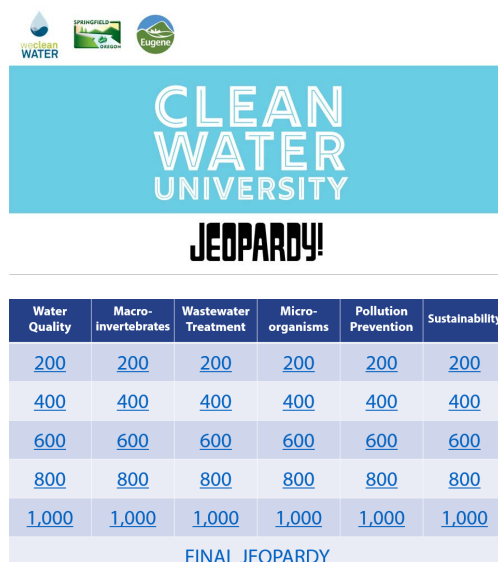
Wrap-Up Jeopardy Game

Wrap-Up Game

To help students review what they've learned during Clean Water University, play a fun game of [Jeopardy using our PowerPoint presentation](#). Students will answer questions on water quality, macroinvertebrates, wastewater treatment, microorganisms, pollution prevention, and sustainability. This game can be played either in person or virtually, with the teacher managing the PowerPoint presentation either in classroom or via screen sharing. If you need technical assistance or would like MWMC staff to facilitate the game via Zoom or another video conferencing platform, please email lspiro@springfield-or.gov.

How to Play Clean Water University Jeopardy

1. Access the CWU Jeopardy PowerPoint presentation and play the slideshow from the beginning. Additionally, open a blank spreadsheet or use a piece of paper and a pen to keep score. Share the PowerPoint presentation with your class either on a projector if in person or through screen sharing in your video conferencing platform if virtual.
2. Split your class into 3-5 teams. Ask each team to designate one team leader to announce answers to different questions aloud to the class. If playing in a virtual environment, have each team leader create their own team group chat in order to discuss their answers.
3. Starting with Team 1, have students select a category/point value. When the team makes that selection, simply click on the point value within the specified category's column. This will take you to the question associated with that specific category/point value.
4. Each question slide contains a progress bar with a duration of 30 seconds, which begins automatically once you click to that slide. The team that selected the question will have those 30 seconds to agree on one final answer, which must be in the form of a question. Have the team leader announce their answer before the time runs out. After the time is up, the correct answer will appear on screen for the whole class to see. If the team answers before time is up, click in any blank area on the slide to reveal the correct answer.
5. If the team answers the question correctly, they win the designated number of points for that specific question. If they answer incorrectly, they lose that number of points. Keep track of those scores using the previously mentioned spreadsheet or pen and paper.
6. Once the correct answer has been revealed, click the question to be taken back to the grid of categories and point values. Move on to the other teams, repeating steps 3-5 for each team. Categories/point values that have already been selected by another team will turn purple.
7. After all 30 questions have been answered, click Final Jeopardy within the categories/point values grid. All teams will get to answer this question. Teams will be able to see this last question before the countdown begins and select a number of points to wager, with a maximum of their current score. If the team answers correctly, they win that number of points and if they answer incorrectly, they lose that number of points. Once each team has selected a number of points, click anywhere in the slide to start the countdown. Ask each team leader to write their answer down on a piece of paper, and wait to reveal their answer until the timer has ended and all teams have come up with an answer. If virtual, have each team leader send their answer to you in a private message. Then click in any blank area on the slide to reveal the correct answer.
8. Tally the final scores for each team and reveal your winner! Have fun!



The image shows the logo for Clean Water University Jeopardy! at the top, with the text "CLEAN WATER UNIVERSITY" and "JEOPARDY!" below it. Below the logo is a grid of categories and point values. The categories are Water Quality, Macro-invertebrates, Wastewater Treatment, Micro-organisms, Pollution Prevention, and Sustainability. The point values are 200, 400, 600, 800, and 1,000. The bottom row of the grid is labeled "FINAL JEOPARDY".

Water Quality	Macro-invertebrates	Wastewater Treatment	Micro-organisms	Pollution Prevention	Sustainability
200	200	200	200	200	200
400	400	400	400	400	400
600	600	600	600	600	600
800	800	800	800	800	800
1,000	1,000	1,000	1,000	1,000	1,000
FINAL JEOPARDY					

Conclusions

In Closing

That's it! You've made it to the end of our Clean Water University virtual curriculum for the 2022-2023 school year. Thank you so much again for your participation. We hope you found the materials valuable in teaching your students about the importance of clean water. We would love to hear your feedback. Please feel free to send any questions or comments to lspirospringfield-or.gov and be on the lookout for a feedback survey that will be emailed to you.

As a reminder if you haven't done so already, please submit proof of your participation in Clean Water University to lspirospringfield-or.gov to enter your entire class into a drawing for memberships to the Eugene Science Center. See page 3 for more details on both this incentive and the \$500 donation to participating schools' STEM/science programs.

Recap of Key Learning Outcomes

- Explain where water comes from.
- Identify the various stages of the water cycle.
- Recognize water as an essential resource.
- Explain how drinking water gets to their home.
- Identify various sources of drinking water.
- Recognize that water must be properly cleaned to rid it of pollutants before it can become drinking water.
- Identify the key measures that help us determine the health of a river, stream, or lake.
- Explain why high levels of water quality are important to human and animal life.
- Recognize the role stormwater plays in the quality of our local waterways.
- Define a macroinvertebrate and recognize their important role in the food web.
- Explain the connection between clean water and the food web.
- Identify some common macroinvertebrates such as mayflies, dragonflies, and aquatic earthworms.
- Explain where their wastewater goes to be cleaned.
- Explain why effectively cleaning wastewater helps to protect our community's health and local environment.
- Identify the key steps in the wastewater treatment process.
- Define a microorganism.
- Explain the role microorganisms play in the wastewater treatment process.
- Identify some of the common microorganisms present in the biological treatment of wastewater.
- Recognize the importance of preventing pollution from entering the wastewater collection system.
- Identify actions that community members can take to prevent pollution, such as keeping trash out of the toilet.
- Explain what happens to pollutants when they are flushed/poured down the drain.
- Explain the benefits of sustainability efforts in protecting our local environment.
- Identify the byproducts of the wastewater treatment process that the MWMC beneficially reuses: biosolids, recycled water, and renewable natural gas.
- Recognize that the Biocycle Farm uses waste to produce wood, a renewable resource for our community.

