

# Lesson 3: The Value of a Water Footprint



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## SUMMARY

Session 1 of this lesson begins with a quick activity to get students thinking about their direct and virtual water use. It introduces a few new ideas for virtual water use that may surprise students, including the virtual water required for the products we buy and use. Then students form marketing teams to explore five categories of water use (indoor, outdoor, diet, electricity, and buying habits) and create infographic posters to share what they learn. Then, in Session 2, students remain in five teams to audit the school's indoor and outdoor direct water use as well as several categories of virtual water use: food, energy, and electronics. They use what they learn to create a strategic conservation action plan that incorporates their How to Save Water awareness campaign in an effort to decrease the school's overall virtual water use. The lesson can be conducted as a short project or a more comprehensive capstone project.

## ESTIMATED TIME NEEDED

Two 55-minute sessions plus extra time for school audit and implementing conservation ideas on campus

## KEY VOCABULARY

direct water use, indirect water use, virtual water use, water footprint, sustainability, electronics, conservation, awareness campaign, audit, strategic action plan

## OBJECTIVES

Students will be able to ...

- ✓ Quickly categorize examples of water use as either direct or virtual.
- ✓ Create an infographic poster and awareness campaign to communicate water conservation ideas to the school community.
- ✓ Work with classmates to audit the school's direct and virtual water use.
- ✓ Create a strategic action plan with suggestions for improving the school's water footprint as well as ideas for implementing their awareness campaign.

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## INSTRUCTIONAL EMPHASIS

Instructional methods, key skills, and values/attitudes emphasized in this lesson include the following:

### VALUES/ATTITUDES

- Leadership
- Resilience
- Mindfulness
- Optimism
- Empathy
- Curiosity
- Global Citizenry

### SKILLS

- Critical Thinking
- Creative Problem Solving
- Collaborating
- Communicating
- Information Literacy
- Systems Thinking
- Adaptability

### METHODS

- Problem-Based Learning
- Real-World Application
- Modeling
- Brain-Based Learning
- Multiple Intelligences
- Technology Integration
- Multi-Disciplinary

## ATTACHMENTS

### SESSION 1: SAVING WATER AT HOME

- Direct and Virtual Water Use Game Cards
- How to Save Water Infographic Poster
- How to Save Water Education Campaign Worksheet
- My Saving Water Game Plan

### SESSION 2: SAVING WATER ON CAMPUS

- School Water Audit: Direct Water Use
- School Water Audit: Virtual Water Use
- Water Footprint School Project Rubric
- Water Footprint School Project Group Evaluation
- Participation Checklist

## MATERIALS

### SESSION 1: SAVING WATER AT HOME

- Student access to computers, tablets, and/or smart phones, and the Internet
- Five bags or envelopes for game cards
- Clock or watch
- Thick paper for creating posters (at least five)
- Colored markers

### SESSION 2: SAVING WATER ON CAMPUS

- Audiovisual presentation equipment with access to the Internet

## STANDARDS CORRELATIONS

This lesson, with all components included, is linked to the following standards:

### COMMON CORE STATE STANDARDS (CCSS) English

Language Arts: RI.9-10.2; W.9-10.7, 10; SL.9-10.1A-D, 2-6; L.9-10.6; RH.9-10.2, 5-9; RST.9-10.2, 4-5, 7-10; WHST.9-10.4-7, 10

Mathematics: HSN.Q.A1-3; MD.B.5, 6, 7

### NEXT GENERATION SCIENCE STANDARDS (NGSS)

Earth's Systems: HS-ESS3-2, 4, 6

Ecosystems: Interactions, Energy, and Dynamics: HS-LS1-1-2, 7

Engineering Design: HS-ETS1-1-3

### TEXAS ESSENTIAL KNOWLEDGE AND SKILLS (TEKS)

§112.34. Biology: 2E-H; 3B, D; 12E

§112.36. Earth and Space Science: 1C; 2.G-I; 3A-E; 12D-E; 13A

§112.37. Environmental Systems: 2.E-K; 3.B-E; 5.B-F; 6B; 7C; 8A-B; 9E-F, J

### CLOUD EDUCATION FOR SUSTAINABILITY (EFS)

#### STANDARDS & PERFORMANCE INDICATORS

Grades 3-12: A4-5; B7-13; C1, C3-4, C6-7, C9, C17-18, C20-25, C28-37, C40-42, C46, C49-51; D1, D5, D7; E4, E7; F1, F3, F5A-C, F6; G1-34; H3-7, H9, H11-12; I16, I19-23, I27, I34-35

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### BACKGROUND INFORMATION

This lesson is designed to be largely student driven, with you serving as a facilitator. There are many benefits to having students take charge in this way. As students take responsibility for and assume leadership roles in creating a more sustainable environment at your school, they gain an understanding of the importance of caring for common community resources, and they set an example for other students and other schools. Students also learn much about the dynamics of systems and change as they see the complex nature of school systems, how those systems change over time, and the impact that seemingly insignificant or minor decisions can have on the larger system.

Emphasize to students that you are trusting and empowering them to work individually and together through this lesson to effect positive changes for their shared school community. Explain that they have an opportunity here to serve their community through civic engagement to protect vital local resources, set a global model, and act in service to a healthy and sustainable future. They are not just students but also community leaders. Encourage students to take this opportunity to gain valuable experience and learn the essential skills needed to address local and global challenges, including cooperating with others to resolve conflict and build consensus.



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### PROBLEM-BASED LEARNING TIPS

This lesson helps students to pull together all their thoughts and ideas and put them into action in a meaningful way. Students leading their own learning process can be a game changer for improving educational outcomes. To help students with this effort, you may wish to identify possible resources to support and inspire their ideas. One idea is to find out if students qualify for local or national programs (such as via their local water authority, local or state environmental agencies, or the Environmental Protection Agency) that support student efforts to implement environmental improvements.

Remind students to refer back to their guiding questions to direct their progress. You may also suggest they improve their questions based on what they have learned so far. For example, “Could changing water consumption habits impact global climate change for the better?” might evolve to “In response to global climate change, could we change our water consumption habits to make us more climate resilient?” or “Are there consumption habits or behaviors that contribute to global climate change and also threaten our water supplies?”

This is the culminating project in the problem-based learning module. Remind students to carefully track their data and identify a way to assess the impact of their project after it is complete. Encourage them to keep their driving question in mind and consider how their ideas and solutions might answer that question in a way they can demonstrate to others.

You could also consider (and get student input on) how you might store student data from year one and provide it to students in year two as a basepoint for comparison. You can then give students in year three the data from years one and two for comparison, and so on. This provides additional opportunities for students to mimic real-world collaboration between groups and across the years.

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## IN ADVANCE

### SESSION 1: SAVING WATER AT HOME

Review the instructions for the Engage activity. Make five copies of page one of the Direct and Virtual Water Use Game Cards. Cut out and fold the cards, creating five sets. Mix each set well and put it in a bag or envelope. Note that the page that follows the game cards is an answer key that you can use to evaluate each group's answers. Plan to have a printed or electronic copy of that page handy to evaluate each group's sorted cards. You can make fewer or more copies of the game cards if you prefer to have larger or smaller groups. You can also laminate the cards so they can be used multiple times. Before class begins, set up five stations so students have room to shuffle the cards into the two categories. You may wish to have prizes available—such as refillable water bottles with your school's logo—to award members of the team with the most correct answers. Also, be aware that you can adjust as necessary to suit your classroom needs.

Make five copies of the How to Save Water Infographic Poster and the How to Save Water Education Campaign Worksheet. Copy My Saving Water Game Plan for each student.

### SESSION 2: SAVING WATER ON CAMPUS

Read through the lesson and map out parameters to help guide and support your students. For example, you might want to provide them with examples of strategies that are particularly relevant to your school and/or give them additional tools they can use for planning this activity, such as a timeline or checklist.

This is a project that students could implement throughout the course of a semester, depending on their audit results, project ideas, and administrative support levels. You could also structure the lesson to cover a much shorter duration by adding time restrictions, milestone dates, and other limitations. Decide what works best for your circumstances. You may want to start small and then expand the lesson in another semester or school year, depending how the initial test run goes. Alternatively, you could allow students the freedom now to execute a comprehensive audit and see their projects through, and apply lessons learned with subsequent classes.

Be prepared to help students secure their interviews. If individual interviews are impractical, consider inviting a custodian, school engineer, or other staff member who has broad knowledge of school operations to the classroom and direct all groups to interview him or her. Make sure students prepare questions and have a clear agenda to make the most of the guest's time.

Copy lesson materials according to your project plans.

## Notes

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### ACTIVITY BREAKDOWN

#### SESSION 1: SAVING WATER AT HOME

Time	Exercise	Description
5 min.	Engage	In this rapid-response activity, students work in teams to sort cards quickly into direct and virtual water use categories. The teacher declares the team with the most correct answers to be the winning team.
30 min.	Explore	Students review a poster called How to Save Water. Then they work in five marketing teams to create their own posters for awareness campaigns to educate their school community, with each team spreading awareness on one of the five topics shown on the poster.
10 min.	Explain	Students share their posters with the class to highlight key water conservation strategies.
5 min.	Elaborate	Students work independently to brainstorm direct and indirect ways they could improve their personal water footprint, and then they devise a plan to reduce their personal water footprint.
5 min.	Evaluate	Facilitate a classroom discussion on students' thoughts about their plan and this process. You can also use the Reflection Questions to further stimulate discussion, or you could assign the questions as a homework assignment.

#### SESSION 2: SAVING WATER ON CAMPUS

Time	Exercise	Description
10 min.	Engage	Students discuss their progress so far with personal water savings. Then they watch a video about students who took action to help reduce the water footprint of their school campus.
Varies	Explore	Students rejoin the marketing teams they formed in Session 1 to conduct direct (indoor or outdoor) or virtual (food, energy, and electronics purchasing) audits of the school to explore strategies for reducing the school's water footprint.
30 min.	Explain	Teams use their audit results to create a strategy they can pitch to school administrators to reduce the school's water footprint.
Varies	Elaborate	Students determine the best way to see the water footprint reduction ideas through to completion, including getting support from the school community and beyond to implement their strategies on campus.
15 min.	Evaluate	Students conduct a formal debriefing session to evaluate what they learned in the class as well as how they might better implement conservation improvement plans or improve their water footprint personally and on campus.

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## IMPLEMENTATION INSTRUCTIONS

### SESSION 1: SAVING WATER AT HOME

#### Engage

1. Begin by dividing the class into five groups—you may wish to do this by randomly assigning students to a work station as they walk into the room.
2. Once all students are assigned to a work station, give each group a bag or envelope of game cards and instruct them not to remove the cards until you give them the OK.
3. Tell students that within the bag or envelope, they will find a series of cards that each list an example of a step they could take to conserve water. You'd like them to work with their group to quickly sort those conservation actions into two categories: direct water conservation and virtual water conservation. Encourage them to recall what they've learned in the past two lessons in order to do so.
4. When each group is ready, tell them, "Go!" and start your timer for three minutes.
5. After three minutes, say, "Stop!" and make sure each group stops sorting and steps away from their station.
6. Go to each station and use the answer key to identify how many correct answers each team has. If a group has not identified all the correct answers, give them another opportunity to rethink their answers. When all groups have identified the correct answers, congratulate students for their participation in this quick conservation challenge.
7. Review the correct answers with the class. Then have a quick discussion about the activity. Ask students: Which questions confused you the most? (*those that had nothing to do with water*) What category did those confusing cards end up in? (*indirect*) What is another word for "indirect" water usage? (*virtual*) How would you define "virtual" water? (*Virtual water is the hidden flow of water required to create foods or other consumer goods before they are delivered to the end consumer.*) Remind students that, in the last class, they discussed the virtual water associated with their diet. In this class, they are going to learn about the virtual water associated with other consumer goods and services.
8. First, though, tell students that you'd like them to do a little thought exercise.

#### Explore

9. At this point, you can have students remain at their five stations, or you can have them reorganize, forming five new groups.
10. Display the How to Save Water Infographic Poster for the class to see. Ask students: What do you think of this poster? Is it helpful in getting across key information about water conservation? Why? What works for you, and what doesn't work for you? (*Sample answers: It's colorful. There are a number of strategies on the page but not too many. I like the graphics—they are fun and help draw me into the content.*)

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### IMPLEMENTATION INSTRUCTIONS, continued

#### SESSION 1: SAVING WATER AT HOME, continued

11. Then give each group a copy of the How to Save Water Infographic Poster and a copy of the How to Save Water Awareness Campaign Worksheet. Assign each group one of the five topics shown on the poster.
12. Once every group has a poster, worksheet, and topic assignment, tell students you are designating them as marketing specialists who have been hired to create posters that will teach their school community key water conservation strategies. The client is looking for five different posters, and you've assigned one poster to each marketing group.
13. Review the How to Save Water Awareness Campaign Worksheet with the class, pointing out they will first brainstorm strategies for saving water in their assigned category, then they will categorize those ideas as direct or virtual. Next, they will do some research, starting with the [watercalculator.org/intro](http://watercalculator.org/intro) site, to get even more ideas. Finally, they will put it all together in the form of a compelling infographic poster that will encourage members of the school community to practice direct and virtual water conservation strategies.
14. As the marketing teams work, circulate and encourage students to select an interesting mix of direct and virtual strategies for their infographic poster. They should think about grabbing the attention of fellow students and teachers with memorable and helpful water conservation ideas as opposed to inundating the readers with too much information to grasp as they pass by in the hallway.

#### Explain

15. Have students share their posters with the class as well as any additional information they'd like to relay to help their classmates fully absorb what they've learned.

#### Elaborate

16. Give each student a copy of My Saving Water Game Plan and tell them for this activity you'd like them to work on their own. Direct them to follow the instructions on the worksheet to first brainstorm direct and indirect ways they could improve their personal water footprint in each of the five categories they've learned about.
17. After a minute or two of brainstorming, encourage students to move on to the second part of the worksheet, which involves selecting from each of the five categories one or two ideas they feel are very specific and doable for them, such as "I will use a timer to make sure my showers are no longer than five minutes"; "I will use a handheld spray nozzle rather than a sprinkler when I water our garden"; "I will eat vegetarian twice a week"; "when I want to buy new clothes, I'll check the resale shop first to see what they have." Have them put a star next to each of those items.
18. Finally, tell students to use the last page to create their personal action plan by listing the items they starred on this page. Encourage students to take this plan home as a reminder of the positive steps they are taking to help create a sustainable future.

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### IMPLEMENTATION INSTRUCTIONS, continued

#### SESSION 1: SAVING WATER AT HOME, continued

##### Evaluate

19. Facilitate a classroom discussion, encouraging student volunteers to talk about this activity. Ask: Do you think you can achieve your personal action plan? What do you think about the worthiness of this attempt? Do you believe you can make a difference? Explain.
20. If time permits, use the Reflection Questions to further stimulate discussion and check students' understanding of key topics. If time is short, you could assign the questions for homework.

#### SESSION 2: SAVING WATER ON CAMPUS

##### Engage

1. Encourage students to share whether they've made any progress with their personal water conservation efforts at home. Celebrate and encourage their progress.
2. Share with students that their conservation efforts make a difference, especially when you add up their collective efforts. Ask: What would be the overall impact if we could get everyone on campus to make positive steps like you have? Tell students this school building requires a great deal of water. What if we could find ways to encourage students as well as school administrators to save water?
3. Show students the video [Modesto students learn water-saving ways for campus](#), which is about students at one high school who are helping their school conserve water.
4. Explain that another great place to see a big impact in water conservation is from businesses. Businesses have operations that often require enormous amounts of direct and virtual water. They also usually have buildings (sometimes several!) that require direct and virtual water to run and maintain. Tell students: Think about it; if you can make an impact with minor changes to your lifestyle, imagine the impact if businesses would do something similar to what you did—evaluate their water use, brainstorm doable action steps for conserving water, and then commit themselves to taking those steps!



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### IMPLEMENTATION INSTRUCTIONS, continued

#### SESSION 2: SAVING WATER ON CAMPUS, continued

##### Explore

- Tell students that a school is a business of sorts, with many operations that require direct or virtual water use. As a result, next you are going to have them conduct an audit of their school campus to identify places where your school could take steps to save water directly or virtually.
- Have students join the marketing teams they formed in the last session. Tell them, for this next activity, they will be conducting an audit of their school that is similar to the awareness campaign they began. Use the following table to give each group their new assignment and worksheet.

If a team researched ...	Give them this auditing worksheet (task) ...
Indoor water	School Water Audit: Direct Water Use (Indoor)
Outdoor water	School Water Audit: Direct Water Use (Outdoor)
Diet	School Water Audit: Virtual Water Use (Food Purchasing)
Electricity	School Water Audit: Virtual Water Use (Energy Use)
Buying habits	School Water Audit: Virtual Water Use (Electronics Purchasing)

- Tell students they are now ready to complete their audit. Explain that this process may require more than one class session, as well as time outside of class, to complete. In addition, each team's tasks and processes are different, so each may have a different timeline.
- Instruct teams to follow the instructions on their worksheet to conduct their school audit and synthesize what they learn.
- Be available to help students as they plan a strategy—this may be something very new to them. Remind them of the tremendous wealth of resources available at [watercalculator.org](http://watercalculator.org) (using the calculator questions as a model for their own) and [watercalculator.org/intro](http://watercalculator.org/intro) for information on their specific audit category.

##### Explain

- When teams complete their audits, instruct them to create a strategy they can pitch to school administrators to reduce the school's water footprint. Their strategy should include one or two ideas that the school could implement, as well as how they expect to get buy-in from different stakeholder groups. Encourage students to weave their How to Save Water Awareness Campaign into their plan, making this step part of their overall campaign. Also instruct them to put together details that could help administrators better understand and support the plan, such as key dates, student activities/contributions, expected costs, fundraising ideas, etc. After you have approved of a team's strategy, encourage them to set up a time and date to meet with school administrators. (Or wait until all teams are ready, then have teams pitch their ideas together.)

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### IMPLEMENTATION INSTRUCTIONS, continued

#### SESSION 2: SAVING WATER ON CAMPUS, continued

##### Elaborate

11. Once students have administrative support for one or more of the pitched ideas, have students determine the best way to see the idea through to completion. If administrators are fully responsible for enacting the idea, students could determine how they might help evaluate the effectiveness of the program. For example, they could plan to conduct another audit weeks or months after the plan is put into place and compare those results to the pre-audit results. If one or more teams gets buy-in to put one or more ideas into action, you can spread the work out among the entire class and have students divide into subgroups to tackle specific aspects— such as fundraising, changing facility practices, getting the necessary permissions, etc.—to make their plan a reality.

##### Evaluate

12. Have students conduct a formal debriefing session to evaluate what they learned in the class as well as how they might better implement conservation improvement plans or improve their water footprint personally and on campus.

### ADDITIONAL TEACHING TIP

If time is limited, you could have students do a “mini audit” by limiting their evaluation to your classroom or a much smaller area of the campus and then using those results to make estimates for the rest of the school. After the mini audit, encourage students to discuss the validity of their extrapolations. You could also invite a custodian, school engineer, or other staff member with broad knowledge of school operations to help students analyze and discuss their results.



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### REFLECTION QUESTIONS

Use the following questions to prompt critical thinking and guide students to reflect on the lesson:

- Did your efforts in this lesson include water conservation strategies that work on more than one level? Explain. *(Sample answer: Yes! Our campaign includes a direct-water-use conservation strategy and a virtual-water-use conservation strategy, as well as business and personal water savings strategies. The awareness campaign educates the school community to change their behaviors at school and at home to save water.)*
- What is your biggest take-away from this lesson? Explain. *(Sample answer: There is so much we can do to create a more sustainable future. Most of us don't think very much about how our actions are impacting the planet. With a little awareness and simple changes, individuals and businesses/schools can create collective action that has a huge impact on water conservation.)*
- What do you think of when you hear the word “sustainability”? Is it a positive word to you or a negative one? Explain. *(Sample answer: It is a good word because to me it means being kind to the Earth and thinking of our future and our kids' future, but some people equate it with additional and unnecessary costs and work.)*
- If you were to recommend a simple change to a friend or family member who is interested in reducing their water footprint, what would it be? Explain. *(Sample answer: I would recommend that they pick one day per week to not eat any meat. Meat has such a big water footprint that if we all picked one day to avoid eating meat, we could together make a big difference in conserving water.)*
- If you were in the ranching business, how would you feel about efforts to reduce water footprints by cutting back on eating meat? What might be a solution? *(Sample answer: If everyone reduced their water footprint by cutting back on meat, it would hurt me financially, so I would not be happy about that. However, it's also important to think about what is realistic for the long-term health of the planet. Perhaps with coordinated efforts from farmers and ranchers, businesses, and government, we can come up with solutions that will work for everyone. For example, maybe we can switch to more sustainable farming and ranching practices such as ensuring animals are pasture-raised, which can increase the value of the meat, is more humane to the animals and, if done right, decreases negative water, land and climate impacts.)*
- People often talk about prioritizing “the bottom line” in business, and this essentially means that what matters most is whether a business is profitable. Another way to look at business accountability is called the “triple bottom line.” This approach involves conducting business in a way that is good for people, good for the environment, and good for profit. What do you think about this approach? *(Sample answer: It's easy for me to say as someone who has never owned a business, but it obviously sounds like a much better approach. It is definitely a more sustainable approach. If businesses (and schools and governments) are only concerned about money, people and the planet are going to face some harsh consequences. We already are facing consequences such as climate change and air pollution, so really, this is the only way forward. However, I understand why it's a difficult mindset to change for business owners who have been struggling to stay in business and even for business owners who are making a profit. Business owners may feel like, in the short term, there's a lot to lose.)*

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### ASSESSMENT OPPORTUNITIES

You can use the Participation Checklist to monitor student participation in the various activities. Give students a copy of the Water Footprint School Project Rubric when they begin their auditing and project work so they have a sense of expectations. Then you can use the rubric to assess each group's efforts. You can also let students participate in the evaluation process by giving each student a copy of the Water Footprint School Project Group Evaluation to reflect on the effectiveness of their own group's results. The Reflection Questions on the previous page also provide an excellent opportunity for checking students' understanding of key topics—whether you facilitate a class discussion or assign the questions for homework or independent work. To further check student comprehension as well as to reteach and extend key ideas from the lesson, see the Additional Activities and Extensions section, which begins on the next page.

### DIFFERENTIATION

- Students whose native language is Spanish can access a [Spanish](#) version of the Water Footprint Calculator referred to in Session 1. Also remind them that the water saving tips are available in [Spanish](#).
- You may wish to determine in advance how you would like to group students in order to balance their strengths and weaknesses. Then keep an eye on how well the groups function together. Before students begin the auditing activity, you could readjust the marketing teams to create stronger groups as necessary. If a group is having trouble, you could also encourage students to recommend changes to groups that stem from their recognizing and taking responsibility for the unique contributions they have to offer.

### CULTURAL ADAPTATION NOTE

Many schools around the world have become “green schools.” In these schools, many procedures and structures have been designed to conserve water, energy, waste, and other resources. Suggest that students find such a school to research and report back to the class. One helpful resource is the [Global Coalition for Green Schools](#). Have students choose a green school from the [Resources: Project Profiles](#) listing and share with the class what they learned about the school, including whether people in their community know about and value green building and green schools.



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### ADDITIONAL ACTIVITIES AND EXTENSIONS

#### COMMUNITY CONNECTIONS

As students make plans for water conservation projects, encourage them to think about how they could involve the local community. For example, students could invite parents and community members to help install a xeriscape garden or help facilitate an e-waste recycling or repair program. Local businesses may also be willing to support student projects with donations or employee volunteers.

#### CROSS-DISCIPLINARY CONNECTION: COMMUNICATIONS/MEDIA

Have students share the posters they created in Session 1 with the school community by posting them in hallways around the school. Students could also create an awareness campaign by surveying the school community (students, faculty, and staff) about their knowledge of and attitudes toward water footprints and water conservation before and after the campaign. They could use this data to help inform their strategic school water conservation plan.

Students could extend their How to Save Water Education Campaign using a variety of modalities, such as a newspaper ad, a public service announcement (PSA), a poster, and a video. They could even work with school administrators to create a school-wide contest in which the entire student body votes to determine the best advertising slogan or campaign focus, which would then be used throughout the school and possibly beyond.

#### CROSS-DISCIPLINARY CONNECTION: LANGUAGE ARTS

Encourage students to use writing strategies they've learned in language arts to execute their communications strategies. For example, they might refer to their language arts notes or text to find strategies for writing a persuasive letter. Or students may want to review how to outline ideas and incorporate student and inspirational quotes into their materials. You may even wish to co-teach this lesson with a language arts or communications instructor.

#### CROSS-DISCIPLINARY CONNECTION: BUSINESS

Ask students if they can define the term “greenwashing.” (*Sample answer: When a business portrays itself as an environmentally concerned operation in order to diminish or hide a range of practices that are harmful to the environment.*) Encourage them to research the concept and report back to the class examples of greenwashing as well as strategies to see through such practices.

#### CROSS-DISCIPLINARY CONNECTION: SOCIAL STUDIES

Encourage students to find out who approves funding for your school. If your school is public, representatives from local or regional governmental offices likely approve funds. If your school is private, a school board likely makes funding decisions. Some schools have considerable freedom in how they spend funds to make improvements at the school; other schools must go through a very complicated and slow process to get approvals to make changes. The more students know about the realities of your school's funding situation, the better they will be at making recommendations for accessing funds through traditional pathways or devising plans for fundraising through nontraditional pathways to support their strategic recommendations.

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### ADDITIONAL ACTIVITIES AND EXTENSIONS, continued

#### CROSS-DISCIPLINARY CONNECTION: MATH

Share with students that it's not always easy to communicate complex information to diverse groups of people. A useful way to convey complex information is to draw a comparison between the complex information and something more commonly known. For example, students at Akins High School in Austin, Texas, determined that in one year their school community used 10,695,367 billion gallons of water. They knew that was a lot of water, but they also knew that it was hard for most people to grasp exactly how much water that really is. They decided to compare that figure to something most people could easily imagine—an Olympic-sized swimming pool. They did the math and determined that 10,695,367 billion gallons is equal to about 16,205 filled Olympic-sized swimming pools. Akins students then shared that, in a given year, their school community used enough water to fill more than 16,000 Olympic-sized swimming pools. That number is a little easier for a person anywhere in the world to visualize. Invite students to translate their audit data in a similar way. For example, they might think in terms of bathtubs, glasses, pitchers, jugs, 2-liter bottles, etc. You could also invite a math teacher to the classroom to work with groups to translate their data into terms that are easy to understand.



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#### USING TECHNOLOGY

- Encourage students to visit the [Water News](#) section of [watercalculator.org](#), scan the most recent articles, and pick one that interests them. They could then review the article and write an analysis of it to share with the class.
- Suggest that students watch the video [12 Facts That Will Change the Way You Think About Water](#). Encourage them to evaluate the strengths and weaknesses of the video. Then have them create their own video for their How to Save Water Awareness campaign that incorporates what they learned in this lesson.

#### CAREER INSPIRATION

Share with students the article [What is an Environmental Accountant?](#) Have them consolidate what they learn in a short list of bulleted statements. Interested students could further research that career as well as environmental auditing careers and report back to the class about what they learn.

#### SYSTEMS THINKING

Suggest that students write a short essay about 1) how they applied systems thinking as they assessed their schoolwide audit and the development of their How to Save Water Campaign, and 2) whether they think systems thinking is an effective approach for solving environmental challenges—and why or why not. Then encourage students to share their thoughts in a classroom discussion.

## Lesson 3: The Value of a Water Footprint



### RESOURCES/LINKS FOR THIS LESSON

The following resources were cited in this lesson or relate specifically to this lesson:

- Center for Green Schools, The. (n.d.). Resources. Retrieved from <https://www.centerforgreenschools.org/resources>
- EnvironmentalScience.org. (n.d.). What is an environmental accountant? Retrieved from <https://www.environmentalscience.org/career/environmental-accountant>
- GRACE Communications Foundation. (2019). ¿Cuál es su huella hídrica? Retrieved from <https://www.watercalculator.org/wfc2/esp/>
- GRACE Communications Foundation. (n.d.). Find your water footprint and learn how to save water. Retrieved from <https://www.watercalculator.org/intro/>
- GRACE Communications Foundation. (2019). The latest water news & events. Retrieved from <https://www.watercalculator.org/category/water-news-events/>
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- Journey staff. (2012, January 1). Renewing our partnership. Expanding our impact. Coca-Cola Journey. Retrieved from <https://www.coca-colacompany.com/stories/converging-on-water-an-innovative-conservation-partnership>
- Mumma, L. (2016, October 3). Modesto students learn water-saving ways for campus [Video file]. KCRA3. Retrieved from <https://www.kcra.com/article/modesto-students-learn-water-saving-ways-for-campus/6433746>
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- Watson, Bruce. (2016, August 20) The troubling evolution of corporate greenwashing. The Guardian. Retrieved from <https://www.theguardian.com/sustainable-business/2016/aug/20/greenwashing-environmentalism-lies-companies>
- Yi, C. (2017, October 16). Global Coalition for Green Schools. The Center for Green Schools. Retrieved from <https://www.centerforgreenschools.org/global-coalition-green-schools-0>