

# Water Use and Agriculture

2 Hours

Environmental Science, Social Studies

Grades 5-12

## Learning Objective

Students will determine their water footprints.

Students will identify where they are using the most water.

Students will be able to identify foods by the amount of water necessary in their production.

Students will critique their diets as they relate to water usage.

## Essential Questions

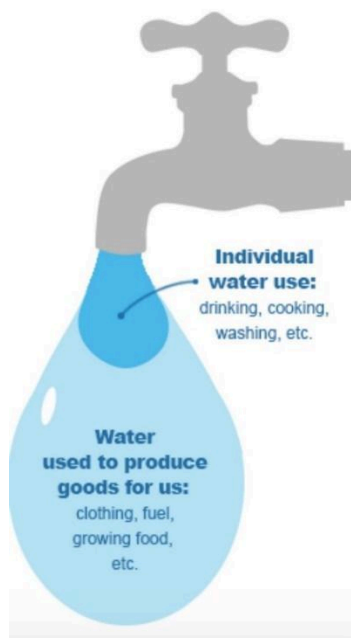
How much water is used to feed us?

## PA STEELS Standards

3.4.3-5.A Analyze how living organisms, including humans, affect the environment in which they live and how their environment affects them.

3.4.9-12.A Analyze how issues, trends, technologies and policies impact agricultural, food and environmental systems and resources.

**Materials:** Internet Access



## Engage

### Activity:

Students will go to <https://watercalculator.org/> to calculate their water footprints. (available in English and Spanish)

“The **Water Footprint Calculator**, estimates daily personal water footprint. Through a series of simple questions about daily routines, this tool accounts for not only the “direct” water you use from the tap, but also the “virtual” water it takes to produce the food you eat, the energy you use and the products you buy.”

There is a worksheet available

[https://watercalculator.org/wp-content/uploads/2019/05/WF\\_MS\\_L1-My-WF-Stats-Student-Worksheet\\_2020-02-25.pdf](https://watercalculator.org/wp-content/uploads/2019/05/WF_MS_L1-My-WF-Stats-Student-Worksheet_2020-02-25.pdf) on which students can collect data about their footprint.

When students have completed their assessment engage in a class discussion about what part of their lives requires the most water use.

Share the following statistics with them:

**Agriculture:** Agricultural processes in the US account for **80 percent** of fresh water consumption.

**Food Waste:** **25 percent** of all freshwater consumed in the US is associated with discarded food; about as much as the volume of Lake Erie.

<https://watercalculator.org/footprint/water-energy-food-nexus/>

## Explore

### Activity:

Hold up a standard sized chocolate bar (1.55 oz.)- or a picture of one and ask students how much water is needed to make the chocolate. Have a liter container and a gallon jug on the table.

After students have registered their guesses- orally (keep track of responses on the board) inform them that 651 liters or 172 gallons of water are required to produce one chocolate bar.

Ask students to turn and talk to a partner. What does this information make them think about?

Divide students into groups of 4. Direct students back to the water calculator website to the Water in Your Food Resource <https://watercalculator.org/water-footprints-101/water-in-your-food/> . Provide each group with 5 foods, options are listed below- more are on the website. Ask groups to look up the food and find out how much water is used in its production.

Foods:

Chocolate	Butter	Chicken	Bread	Yogurt
Coffee	Eggs	Oatmeal	Potato Chips	Apples
Beef	Raisins	Brown Rice	Blueberries	Squash
Pork	Pasta	Mangoes	Strawberries	Pizza
Spinach	Watermelon	Grapes	Tomatoes	Tea
Broccoli	Avocados	Bananas	Carrots	OJ

Ask each group to list the foods according to water needed for production. What does this information say about diet and in particular the way most Americans eat?

Ask each group to create a list of things that can be done to reduce the amount of water necessary for food production. If students have done the **Precision Agriculture Technology** lesson, what is the relationship between the information they have just uncovered the use of technology in agriculture?

## Explain

### Activity:

Watch [https://www.ted.com/talks/mark\\_bittman\\_what\\_s\\_wrong\\_with\\_what\\_we\\_eat?subtitle=en](https://www.ted.com/talks/mark_bittman_what_s_wrong_with_what_we_eat?subtitle=en)

After viewing the video students should respond in writing to the prompt:

What is wrong with what we eat?

## Elaborate

### Activity:

Students will create a dinner menu attempting to minimize the amount of water needed for its production. This can be done independently or in pairs.

Upon completing their menus students will discuss the likelihood that Americans would be willing to change the way they eat if it was better for the environment.

## Evaluate

Throughout this activity there are opportunities for informal assessment:

Water Footprint Data Sheet

Writing prompt about Ted Talk

Final discussion on diet and American Culture