



# How Much H<sub>2</sub>O Did it Take to Make My Lunch?

## SYNOPSIS

Students will discover the amount of water used to grow and process the items in their lunches.

## OBJECTIVES

Students will be able to:

- explain the concept of virtual water
- argue, verbally or in written form, the need to conserve fresh water

## VOCABULARY

- virtual water
  - the amount of freshwater used in the various steps of the production chain. This may include, among other factors depending on the product, the amount of water used to grow the crop and the amount of water used in the manufacturing or processing of the product.

## MATERIALS

- food items from students' lunches
- paper and pencil/pen for each student
- 1 gallon container and a 5 gallon container
- web sites (or print outs) on virtual water and water footprints (accessed on 3/29/10):
  - Water Education Foundation – Water Fact Card (English): <http://www.watereducation.org/store/itemdetail.asp?id=130>
  - Water Education Foundation – Water Fact Card (Spanish): <http://www.watereducation.org/store/itemdetail.asp?id=131>
  - USGS: <http://ga.water.usgs.gov/edu/sc1.html>
  - Water Footprint Network: <http://www.waterfootprint.org/>
  - Water Footprint Calculator: <http://www.waterfootprint.org/?page=cal/WaterFootprintCalculator>
  - Water Footprint Product Gallery: <http://www.waterfootprint.org/?page=files/productgallery>

- Water Footprint Statistics:  
<http://www.waterfootprint.org/?page=files/Productwaterfootprint-statistics>
- Wikipedia – Virtual Water:  
[http://en.wikipedia.org/wiki/Virtual\\_water](http://en.wikipedia.org/wiki/Virtual_water)
- H<sub>2</sub>O Conserve – Water Calculator:  
[http://www.h2oconserve.org/wc\\_disclaimer.php](http://www.h2oconserve.org/wc_disclaimer.php)
- H<sub>2</sub>O Conserve – School Resources:  
[http://www.h2oconserve.org/?page\\_id=51](http://www.h2oconserve.org/?page_id=51)
- TreeHugger Food Water Footprints:  
<http://www.treehugger.com/files/2009/06/from-lettuce-to-beef-whats-water-footprint-of-your-food.php>
- California Foundation for Agriculture in the Classroom – Agricultural Fact and Activity Sheets:  
<http://cfaitc.org/Commodity/Commodity.php>

## INTRODUCTION

This activity can be used alone or in conjunction with the study of content such as the water cycle, conservation, the source of local water, or agriculture.

Explain to the students the concept of **virtual water**.

Depending on the age group and the purpose of the activity, you may want to have students make a prediction about how much virtual water was needed to create their lunch.

## PROCEDURES

1. Have students create a “T-chart” on their piece of paper. In the left column they should list each item in their lunch including the components of each item. For instance, a turkey sandwich might include: bread, turkey, tomato, pickle, lettuce and cheese.
2. Tell the students to use the various web sites, or print outs, to figure out how much virtual water each of the items requires. They should write the amount of water, in gallons or liters, on the right column of the “T-Chart” corresponding to each item. *See the example below.*

Food Item	Virtual Water (gals.)
1 apple	18.5
2 slices of bread	21.4
TOTAL	39.9

3. Once they have completed their chart, they should total the number of gallons or liters required to produce their lunch.
4. Show the students the 1 and 5 gallon containers so they can visualize the amount of virtual water their lunch requires.
5. Have them create a diagram depicting how much water each item uses and the total. Tell the students they may create a pie chart, a bar chart, draw a “container” marked with the various amounts of virtual water, or another creative idea of their own. They can color in their chart and draw their food items around the chart, or cut and paste pictures from a magazine or printed clipart.

### **CHECK FOR UNDERSTANDING**

Have the students share with a partner, or write a paragraph explaining, what virtual water is, and an argument for conserving freshwater in light of the significant water needs of producing food.

### **EXTENSION**

Have the students estimate how many days a year they eat this lunch and calculate their virtual water demand for the year.