



Water Footprint Calculator: 30 minutes

Objectives: Students will examine their water footprint and find ways they can reduce it and promote water sustainability. Start with the water sense quiz, then take the “Water Footprint Calculator”, compare water footprints, discuss how they can reduce their water use, and finally retake the Footprint Calculator with their suggested changes.

Materials

- Water Sense Quiz
 - https://www3.epa.gov/watersense/quiz/game_kids.html
- Water Footprint Calculator Online
 - <https://www.watercalculator.org/>
- Nexus Guide How Food, Energy, and Water are Connected
 - <http://www.gracelinks.org/nexusguide>
- 5-Gallon bucket
- 1-Gallon bucket
- Access to water faucet

Explanation

- Start with the Water Sense Quiz.
 - It can be given individually or as a class. It is simply a primer to give students some perspective on how simple choices can affect their water consumption
 - Go over the results
 - Discuss: What was expected? What was shocking?
- Have the students complete the water footprint calculator
 - Compare Results
 - Discuss how students can reduce their water usage in their home.
- Have the students measure the amount of water produced with a leaky faucet (use 1 gallon bucket), and leaving the faucet on when not in use (use 5 gallon bucket).
- Have students go over the Nexus Guide and discuss ways they can reduce their footprint by changing their food and energy choices
- Redo the Water Footprint Calculator with their suggested changes.
- Discuss how your changes could be implemented at your house? Your school? Your city?

Discuss

What are some ways that the students work to conserve water at home? Are the habits that can be changed at school or at home to help conserve water? How does the water supply affect the growth of Texas? Is it sustainable to double our population and use the same amount of average water? What other effects does excessive personal use cause? Think farming, ranching, wildfires.

Advanced: How does the water supply affect the growth of cities? Where does the water for your city come from? Is it running low? How does weather affect it? How do cities strain the water supply? How can you help?



TEKS

§112.32. Aquatic Science, Beginning with School Year 2010-2011 (One Credit).

(c) Knowledge and skills.

(12) Science concepts. The student understands how human activities impact aquatic environments. The student is expected to:

- (A) predict effects of chemical, organic, physical, and thermal changes from humans on the living and nonliving components of an aquatic ecosystem;
- (B) analyze the cumulative impact of human population growth on an aquatic system;
- (C) investigate the role of humans in unbalanced systems such as invasive species, fish farming, cultural eutrophication, or red tides;
- (D) analyze and discuss how human activities such as fishing, transportation, dams, and recreation influence aquatic environments;

§112.37. Environmental Systems, Beginning with School Year 2010-2011 (One Credit).

(c) Knowledge and skills.

(5) Science concepts. The student knows the interrelationships among the resources within the local environmental system. The student is expected to:

- (B) identify source, use, quality, management, and conservation of water;
- (C) document the use and conservation of both renewable and non-renewable resources as they pertain to sustainability;
- (D) identify renewable and non-renewable resources that must come from outside an ecosystem such as food, water, lumber, and energy;
- (E) analyze and evaluate the economic significance and interdependence of resources within the environmental system; and
- (F) evaluate the impact of waste management methods such as reduction, reuse, recycling, and composting on resource availability.

(9) Science concepts. The student knows the impact of human activities on the environment. The student is expected to:

- (A) identify causes of air, soil, and water pollution, including point and nonpoint sources;
- (B) investigate the types of air, soil, and water pollution such as chlorofluorocarbons, carbon dioxide, pH, pesticide runoff, thermal variations, metallic ions, heavy metals, and nuclear waste;
- (F) evaluate cost-benefit trade-offs of commercial activities such as municipal development, farming, deforestation, over-harvesting, and mining;
- (G) analyze how ethical beliefs can be used to influence scientific practices such as methods for increasing food production;
- (I) discuss the impact of research and technology on social ethics and legal practices in situations such as the design of new buildings, recycling, or emission standards;
- (J) research the advantages and disadvantages of "going green" such as organic gardening and farming, natural methods of pest control, hydroponics, xeriscaping, energy-efficient homes and appliances, and hybrid cars;