

Effective access to drinking water looks like this:



Not this:



Provide access to water that children can and want to drink.

Effective Access means safe, free drinking water is available to all children.¹

Children and adolescents spend many hours at school, making schools an important setting in which to promote hydration and to model and support learning healthy habits. Evidence-based access and promotion of drinking water at school is a cost-effective² way to increase water consumption and prevent childhood obesity.^{3,4}

Key strategies to provide effective water access in schools include:

✓ **Certify Drinking Water Safety**

- 💧 Students avoid drinking fountains over cleanliness and water quality concerns.^{5,6}
- 💧 Schools are responsible for assuring school drinking water meets safety standards for lead through testing and remediation (if needed) and for communicating results to the public.⁷

✓ **Place Accessible Drinking Water in Multiple Key Locations**

- 💧 Ensure free drinking water accessibility in the cafeteria during mealtimes and in key school locations throughout the day such as the main hall, gym, and playground.^{8,9}
- 💧 Provide water sources that are accessible to all, regardless of age or ability.⁹

✓ **Maintain Drinking Water Sources**

- 💧 A 2016 study in MA public schools found 30% of drinking water sources were broken or appeared dirty at any given time.¹⁰
- 💧 Adequately maintaining the condition, appearance, quality and flow rate of drinking water sources improves accessibility and appeal.^{9,10,11}

✓ **Use Water Dispensers with Both Appeal and Function**

- 💧 Dispensers such as bottle filling stations or bottle-less water coolers increase water intake more effectively than traditional drinking fountains.^{4,12}
- 💧 Students report higher satisfaction and intake with chilled water.^{12,13}

✓ **Enable Use of Cups and Bottle Fillers**

- 💧 Research shows that providing a cup or other drinking vessel increases consumption. The average sip from a traditional fountain is only a few tablespoons of water.¹⁴

✓ **Promote Water as a Healthy Beverage**

- 💧 Provide material promoting drinking water near water sources.^{12,14}
- 💧 Ensure age- and culturally-appropriate water messaging⁵ and encourage staff to model healthy beverages choices and behaviors.⁸
- 💧 Include strong and actionable drinking water language in local school wellness policies.¹⁵

Why effective access to safe drinking water at no charge matters for all children.

Water is essential for health and wellbeing.¹⁶ Children need to drink adequate water because they are more active and have a greater surface-to-mass ratio than adults.¹⁷ Yet, 1 in 2 children aged 6-19 in the U.S. are not adequately hydrated.¹⁸

- Improving hydration status can support academic achievement by promoting cognition,^{19,20,21} focus^{22,23} and mood.^{23,24,25}
- Replacing sugar-sweetened beverages with water can reduce childhood obesity^{3,4} and cavities.²⁶
- Improving water access and promotion is especially important for low-income and minority children who are at higher risk for obesity,²⁷ report more negative perceptions about tap water,⁵ and have poorer beverage intake habits.^{5,28}

Current Federal School Drinking Water Legislation

The Healthy, Hunger-Free Kids Act of 2010, (HHFKA) Section 203 requires:

- *“Schools participating in the school lunch program under this Act shall make available to children free of charge, as nutritionally appropriate, potable water for consumption in the place where meals are served during meal service, including breakfast.”*²⁹
- *In 2016 USDA’s Food and Nutrition Service issued a memorandum calling on all its regional offices and state agencies to ensure that children in the National School Lunch Program have access to drinking water that is both free and safe.*³⁰

95% of U.S. schools participate in the National School Lunch Program, making this an opportunity for water access at no charge in school cafeterias for more than 50 million children.³¹

What is known about school drinking water access

The 2014-15 USDA School Nutrition and Meal Cost Study reports that 95% of schools were observed to meet the HHFKA mandate to provide drinking water access at mealtimes.³² But under current federal laws, HHFKA compliance can simply mean having a drinking fountain somewhere in the cafeteria. USDA observed:

- Forty-nine percent of schools provided traditional drinking fountains within the cafeteria; fountains were available within 20 feet of the cafeteria in another 36% of schools.³²
- Fewer than 1 in 4 schools offered water dispensers or coolers in the cafeteria; only 3% of schools offered water bottle filling stations.³²

A national survey of youth found 57.3% reported drinking fountains or dispensers were widely available in their schools.³³

Observations in a representative sample of 240 California public schools found over 75% made water available. However, none met the study’s criteria for excellence in access⁹ which include:

- Safe tap water
- Water access in key locations
- Updated water dispensers
- Well-maintained drinking fountains
- Adequate density of water sources

How to better examine access to school drinking water

Researchers from University of California Nutrition Policy Institute (NPI), Stanford University and University of Washington Center for Community Health developed, validated and feasibility-tested a photo-evidence tool to assess effectiveness of access to drinking water in schools and other community settings. The tool allows data collection through a Citizen Science approach. The photo-evidence toolkit may be found [here](#).

References:

1. Patel AI, Hecht CE, Cradock A, Edwards MA, Ritchie LD. Drinking Water in the United States: Implications of Water Safety, Access and Consumption. *Ann Rev Nutr* 2020;(in press).
2. Kenney EL, Cradock AL, Long MW, Barrett JL, Giles CM, Ward ZJ, Gortmaker SL. Cost-effectiveness of water promotion strategies in schools for preventing childhood obesity and increasing water intake. *Obesity*. 2019;27(12):2037-2045. doi:10.1002/oby.22615
3. Muckelbauer R, Libuda L, Clausen K, Toschke AM, Reinehr T, Kersting M. Promotion and Provision of Drinking Water in Schools for Overweight Prevention: Randomized, Controlled Cluster Trial. *Pediatrics* Apr 2009, 123 (4) e661-e667; doi:10.1542/peds.2008-2186.
4. Schwartz AE, Leardo M, Aneja S, Elbel B. Effect of a School-Based Water Intervention on Child Body Mass Index and Obesity. *JAMA pediatrics*. 2016;170(3):220-226. doi:10.1001/jamapediatrics.2015.3778.
5. Onufrak SJ, Park S, Sharkey JR, Merlo C, Dean WR, Sherry B. Perceptions of tap water and school water fountains and association with intake of plain water and sugar-sweetened beverages. *J Sch Health*. 2014;84(3):195–204. doi:10.1111/josh.12138
6. Patel AI, Bogart LM, Klein DJ, et al. Middle school student attitudes about school drinking fountains and water intake. *Acad Pediatr*. 2014;14(5):471–477. doi:10.1016/j.acap.2014.05.010
7. 3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities. United States Environmental Protection Agency. 2018. Washington, DC; National Drinking Water Alliance Fact Sheet on “Drinking Water Safety in Schools” available at: https://docs.wixstatic.com/ugd/9c073b_8ee98e40cd384c2bbf0db29b369c5c92.pdf
8. Laguna MC, Hecht AA, Ponce J, et al. Teachers as Healthy Beverage Role Models: Relationship of Student and Teacher Beverage Choices in Elementary Schools. *J Community Health* 45, 121–127 (2020). doi.org/10.1007/s10900-019-00717-7
9. Patel AI, Hecht K, Hampton KE, Grumbach JM, Braff-Guajardo E, Brindis CD. Tapping into water: key considerations for achieving excellence in school drinking water access. *Am J Public Health*. 2014;104(7):1314–1319. doi:10.2105/AJPH.2013.301797
10. Kenney EL, Gortmaker SL, Cohen JF, Rimm EB, Cradock AL. Limited School Drinking Water Access for Youth. *J Adolesc Health*. 2016;59(1):24–29. doi:10.1016/j.jadohealth.2016.03.010
11. Lawman HG, Grossman S, Lofton X, Tasian G, Patel AI. Hydrate Philly: An Intervention to Increase Water Access and Appeal in Recreation Centers. *Prev Chronic Dis*. 2020 Feb 20;17:E15. doi:10.5888/pcd17.190277.
12. Patel AI, Grummon AH, Hampton KE, Oliva A, McCulloch CE, Brindis CD. A Trial of the Efficacy and Cost of Water Delivery Systems in San Francisco Bay Area Middle Schools, 2013. *Prev Chronic Dis* 2016;13:160108. doi:10.5888/pcd13.160108
13. Loughridge JL and Barratt J. Does the provision of cooled filtered water in secondary school cafeterias increase water drinking and decrease the purchase of soft drinks? *Journal of Human Nutrition and Dietetics*. 2005;18: 281-286. doi:10.1111/j.1365-277X.2005.00622.x
14. Kenney EL, Gortmaker SL, Carter JE, Howe MC, Reiner JF, Cradock AL. Grab a Cup, Fill It Up! An Intervention to Promote the Convenience of Drinking Water and Increase Student Water Consumption During School Lunch. *Am J Public Health*. 2015;105(9):1777–1783. doi:10.2105/AJPH.2015.302645
15. Improving Access to Drinking Water in Schools. Centers for Disease Control and Prevention and Bridging the Gap Research Program. 2014 Retrieved 2020, Feb. 10 from http://www.bridgingthegapresearch.org/asshttp://www.bridgingthegapresearch.org/asset/p5yzxu/Improving_Access_Drinking_Water_Oct_2014.pdf
16. Popkin BM, D'Anci KE, Rosenberg IH. Water, hydration, and health. *Nutr Rev*. 2010;68(8):439–458. doi:10.1111/j.1753-4887.2010.00304.x
17. Ludmir J. 2012. A primer on pediatric dehydration. Dehydration affects 2 million children a year; here's a review of signs, symptoms and how to tell severity. *EMS World* 41:67-70.
18. Kenney EL, Long MW, Cradock AL, Gortmaker SL. Prevalence of Inadequate Hydration Among US Children and Disparities by Gender and Race/Ethnicity: National Health and Nutrition Examination Survey, 2009-2012. *Am J Public Health*. 2015;105(8):e113–e118. doi:10.2105/AJPH.2015.302572
19. Perry CS, Rapinett G, Glaser NS, Ghetti S. Hydration status moderates the effects of drinking water on children's cognitive performance. *Appetite*. 2015; Dec; 95:520-7.2015, ISSN 0195-6663, doi:10.2016/j.appet.2015.08.006
20. Bar-David Y, Urkin J, Kozminsky E. The effect of voluntary dehydration on cognitive functions of elementary school children. *Acta Pædiatrica*. 2005;94: 1667-1673. doi:10.1080/08035250500254670
21. Benton D, Burgess N. The effect of the consumption of water on the memory and attention of children. *Appetite*. 2009; 53:143–146. ISSN 0195-6663, doi:10.1016/j.appet.2009.05.006.
22. Booth P, Taylor B, Edmonds CJ. Water supplementation improves visual attention and fine motor skills in schoolchildren. *Education and Health*. 2012; 30:75-79.

23. Benton D. Dehydration influences mood and cognition: a plausible hypothesis? *Nutrients*. 2011;3(5):555–573. doi:10.3390/nu3050555
24. Ganio MS, Armstrong LE, Casa DJ, McDermott BP, Lee EC, Yamamoto LM, et al. Mild dehydration impairs cognitive performance and mood of men. *Br J Nutr* 2011;106(10):1535–43. doi:10.1017/S0007114511002005
25. Masento NA, Golightly M, Field DT, Butler LT, van Reekum CM. Effects of hydration status on cognitive performance and mood. *Br J Nutr*. 2014 May 28; 111(10):1841-52. doi:10.1017/S0007114513004455
26. Sohn W, Burt BA, Sowers MR. 2006. Carbonated Soft Drinks and Dental Caries in the Primary Dentition. *Journal of Dental Research* 85:262-6. doi:10.1177/154405910608500311
27. Taveras EM, Gillman MW, Kleinman KP, Rich-Edwards JW, Rifas-Shiman SL. Reducing Racial/Ethnic Disparities in Childhood Obesity: The Role of Early Life Risk Factors. *JAMA Pediatr*. 2013;167(8):731–738. doi:10.1001/jamapediatrics.2013.85
28. Bleich SN, Vercammen KA, Koma JW and Li Z. (2018), Trends in Beverage Consumption Among Children and Adults, 2003-2014. *Obesity*, 26: 432-441. doi:10.1002/oby.22056
29. United States House of Representatives. Healthy, Hunger-Free Kids Act of 2010. P.L. 111-296, 2010.
30. USDA. Resources for Making Potable Water Available in Schools and Child Care Facilities. Memo SP 49-2016, CACFP 18-2016. Retrieved 2020, Feb. 10 from http://media.wix.com/ugd/9c073b_31708a4607294627a28777bc30668936.pdf
31. National School Lunch Program. Food Research & Action Center. 2020. Retrieved 2020, March 2 from <https://frac.org/programs/national-school-lunch-program>
32. U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, School Nutrition and Meal Cost Study, Final Report Volume 1: School Meal Program Operations and School Nutrition Environments by Sarah Forrestal, Charlotte Cabili, Dallas Dotter, Christopher W. Logan, Patricia Connor, Maria Boyle, Ayesha Enver, and Hiren Nissar. Project Officer: John Endahl. Alexandria, VA: April 2019. Available on the Food and Nutrition Service website: <http://www.fns.usda.gov/research-and-analysis>
33. Onufrak SJ, Park S, Wilking C. Student-reported school drinking fountain availability by youth characteristics and state plumbing codes. *Prev Chronic Dis*. 2014;11:E60. Published 2014 Apr 17. doi:10.5888/pcd11.130314

Research brief created with funding from the WK Kellogg Foundation. Disclaimer: Any opinions or recommendations expressed are those of the authors and do not necessarily reflect the view or position of the WK Kellogg Foundation, University of California, University of Washington or the United States Department of Agriculture.