

CEA Hot Schools Survey Executive Summary

The amount of time a child spends in school buildings during their K-12 education totals almost two full years.¹ While in school, children change physically, emotionally, and the physical classroom environment affects their development - as well as helping or harming children's educational achievement.

Medical studies have shown that high air temperatures can result in "heat stress" (i.e. hyperthermia), which reduces the ability of the human brain to think.² Consequently, it is not surprising that empirical research clearly shows that room temperature directly affects educational achievement. A study of PSAT scores of 10 million students found that,

*"... moving from a school with no air-conditioned classrooms to a school with all air-conditioned classrooms reduces the [negative] impact [on test scores] by approximately 78 percent"*³

There is not a legal maximum temperature for schools in Connecticut; however, Conn. Regs. § 22-336-19 limits the maximum temperature in dog kennels to 90° F.⁴

From April through June of 2019, CEA asked teachers at 33 selected schools to collect information on temperature and humidity in their classroom throughout the day. This resulted in a large data sample proving that complaints of sweltering classrooms are justified.

Teachers recorded nearly 5,000 temperature/humidity readings over 61 days. Among participating schools in Fairfield County, there were 153 (163 if using Heat Index) incidents where a school had a maximum daytime temperature above 80.5 degrees Fahrenheit. (80.5° F is the industry standard recommendation for maximum indoor air temperature.)⁵ At both Bridgeport's Bryant Elementary School and Thomas Hooker Elementary School, there were 22 days at each school during 61 days – once every three days. In Stamford, KT Murphy Elementary School had 10 days of maximum temperatures above 80.5° F. In northwestern Connecticut, Lewis Mills High School and Har-Bur Middle School combined had 8 incidents where 80.5° F was exceeded.

The highest recorded indoor temperature by CEA teachers was 108.2° F at Cross Elementary School, in Bridgeport, on June 12th, 2019. In fact, during the eight school days from June 3rd through June 12th there were six days with temperatures at or above 100° F at Cross Elementary School. These high

¹ Eitland, E., Klingensmith, L., MacNaughton, P., & Laurent, J. C. (n.d.). *Schools for Health*. Boston: Harvard T.H. Chan School of Public Health. Retrieved December 5, 2018, from

https://schools.forhealth.org/?utm_content&utm_medium=email&utm_name&utm_source=govdelivery&utm_term.

² Kiyatkin, E. A. (2010, January 1). BRAIN TEMPERATURE HOMEOSTASIS: PHYSIOLOGICAL FLUCTUATIONS AND PATHOLOGICAL SHIFTS. *Frontiers in Bioscience*. Retrieved December 21, 2018, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3149793/>.

³ Goodman, J. (2018, May 28). Harvard Kennedy School. Retrieved December 5, 2018, from When the heat is on, student learning suffers: <https://www.hks.harvard.edu/announcements/when-heat-student-learning-suffers>.

⁴ Sullivan, M. (2016). *AIR QUALITY AND TEMPERATURE IN SCHOOLS*. Connecticut General Assembly, Office of Legislative Research. Retrieved December 7, 2018, from <https://www.cga.ct.gov/2016/rpt/pdf/2016-R-0193.pdf>.

⁵ ANSI/ASHRAE Standard 62.1

temperatures are more than uncomfortable - they are dangerous. Heat stress poses a greater health risk for students and teachers who are medically at-risk, obese, dehydrated, taking prescription drugs, or sunburned, among other risk factors.

Students' educational achievement is higher when classroom temperature is neither extremely hot nor extremely cold.^{6,7,8} Students spend a lot of time in classrooms and having to stay in a sweltering classroom can result in both poor health and lower educational achievement leading to fewer career options throughout a lifetime. Ironically, the Connecticut Department of Public Health recommends keeping "... children indoors and somewhere cool in extreme heat."⁹

How can a teacher safeguard the health of their students and inspire learning on sweltering days when the classroom is just as hot as outside, or hotter?

⁶ Eitland, E., Klingensmith, L., MacNaughton, P., & Laurent, J. C. (n.d.). *Schools for Health*. Boston: Harvard T.H. Chan School of Public Health. Retrieved December 5, 2018, from

https://schools.forhealth.org/?utm_content&utm_medium=email&utm_name&utm_source=govdelivery&utm_term.

⁷ EPA. (2017, January 4). *Making the Business Case for Energy Savings Plus Health: Indoor Air Quality Guidelines for School Building Upgrades*.

Retrieved December 5, 2018, from EPA: <https://www.epa.gov/iaq-schools/making-business-case-energy-savings-plus-health-indoor-air-quality-guidelines-school#affects>.

⁸ EPA. (2016, September 26). *Improve Academic Performance through Better Indoor Air Quality in Schools*. Retrieved December 5, 2018, from EPA: <https://www.epa.gov/iaq-schools/improve-academic-performance-through-better-indoor-air-quality-schools>.

⁹ Connecticut Department of Public Health. (n.d.). *Extreme Heat and Schools*. Retrieved December 5, 2018, from Connecticut Department of Public Health: <https://portal.ct.gov/DPH/Communications/Crisis-and-Emergency-Risk-Communication/Extreme-Heat-and-Schools>.