

# Case Study

## Bristol, CT

### Students in *C8Kids* Double Working Memory, Improve Test Scores

#### Commitment to Cognitive Skills Development

School leaders in Bristol, Connecticut were willing to test new and innovative ideas in their quest to give all students a solid foundation in the skills they need to be successful in school. When they learned of the opportunity to pilot *C8Kids*, a new program designed to improve cognition in young children based on Yale School of Medicine research, they were the first school in the U.S. to sign up.

“We were intrigued by the potential of leveraging physical and computer exercises to improve a child’s ability to think, focus, learn and socially interact,” said John Ryan, coordinator of Bristol Schools’ gifted and talented program. “When you’re out of your comfort zone, that’s where we know rigor and learning are taking place.”

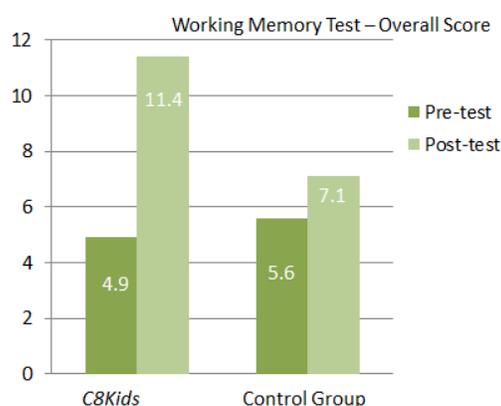
#### Implementation Details

The program was offered Mondays, Tuesdays, and Thursdays, afterschool at Mountain View Elementary School, from October through January. Participating students came from Kindergarten, first and second grades – and included some students with learning disabilities. Students met in the school library at the end of the school day, shared a quick snack, and began work on the computer exercises for 45 minutes. The group then went straight to the gym for physical exercises for another 45 minutes. A series of cognitive assessments designed by the National Institutes of Health (NIH) were administered to both a group of participating students and a control group of similar students who had applied to be in the program but were put on a waiting list.

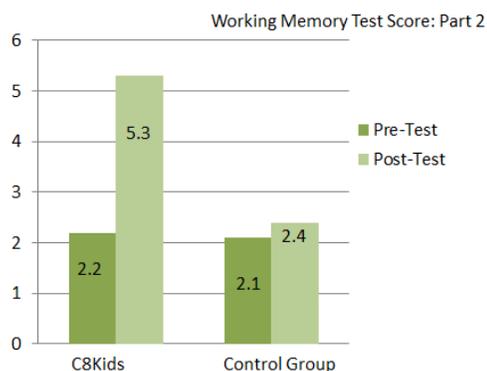


#### Results

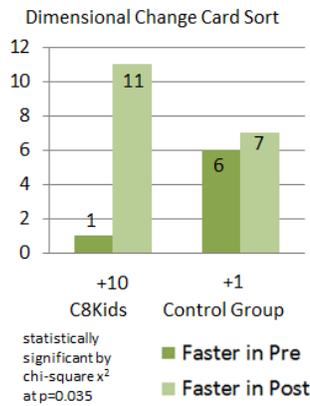
In comparison to the control group, children who participated in *C8Kids* had very significant improvements in working memory. As measured by the NIH Toolbox Working Memory Test, students in *C8Kids* more than doubled (+132%), while their peers inched up only slightly (+26%).



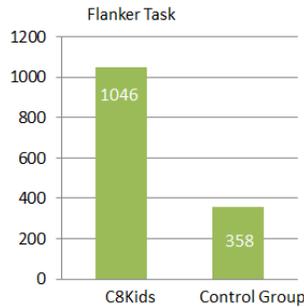
Working memory results for the second (more challenging) half of the test for *C8Kids* were even higher (+148%), while their peers increased even less (+14%).



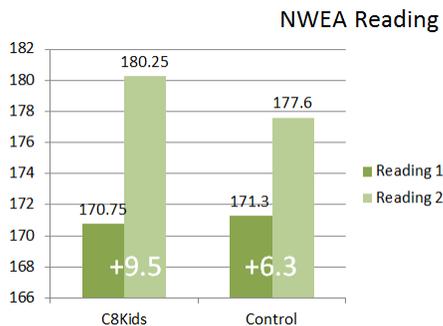
A greater proportion of students in the C8Kids group increased their speed of information processing on a test of cognitive flexibility:



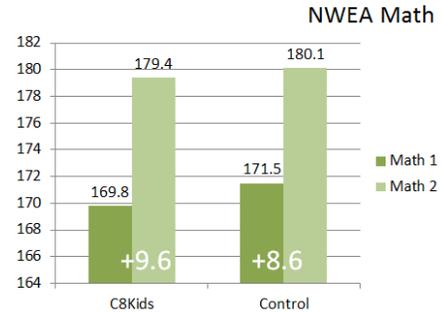
C8Kids posted much higher improvements in Reaction Time (below, in milliseconds) on a test of response inhibition and processing speed.



Student achievement on NWEA standardized assessments of reading and math were also measured before and after the program. 58% of C8Kids increased their reading scores more than 10 points (an equivalent of about one year of growth), while only 33% of the control group raised reading scores more than 10 points:



Similarly, students in C8Kids outperformed their peers on the NWEA math assessment.



### Testimonials

“Everything requires thinking as you’re doing it,” Ryan explained. “Even though they’re laughing, smiling and working hard in the physical part of the program, the different activities are training their brains. After several weeks, I noticed a change in their ability to sit, listen to our directions and do the task. They’re learning to focus, recognize patterns, strengthen their memory, and develop specific motor functions... all important parts of learning.”

Stacey Pratt, a 5th grade teacher and gifted coordinator who helped lead the afterschool C8Kids program, noticed a significant change in one of the youngest kindergarten student participants. “When we administered our pre-test, it took him three sessions to complete. After 12 weeks of the C8 program, he was able to sit and complete the entire post-test in one session.”

Carly Boladz, a first grade teacher with three students in the C8Kids program saw improvement in all eight core cognitive capacities after 12 weeks, “I think it’s a wonderful program, and I know that my students are very excited to go,” Boladz wrote. “They really seem to enjoy it, and are often upset when it’s a day that they don’t have the program.”