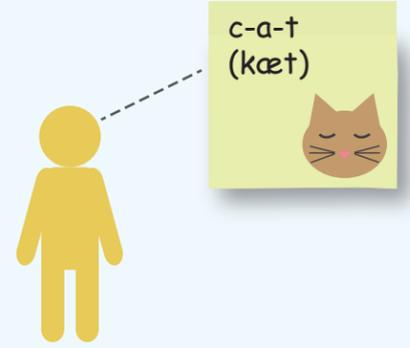


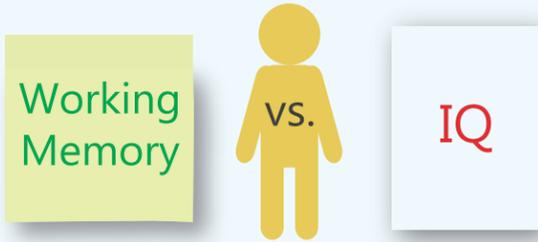
## What is working memory?

Working memory is the ability to hold and process information in our minds for a brief period of time. Kids use their working memory when they're learning math or how to spell a word for the first time. Adults use working memory when learning a new phone number or how to drive. Think of working memory as the **brain's post-it note** on which we place information we need to hold onto and put into action.<sup>1</sup>



## Working memory and school success

Research shows a correlation between high working memory and success in school for a child.



Working memory is **3X** more accurate in predicting literacy skills than IQ. Working memory is **4X** more accurate in predicting math skills than IQ.<sup>2</sup>



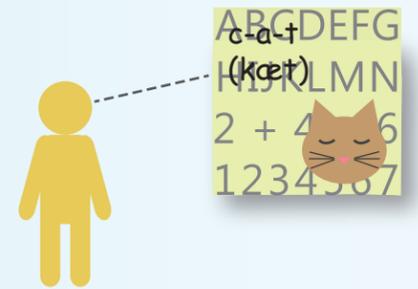
**100%** of students whose working memory scores were in the top **5%** for their age scored above average in language tests.<sup>3</sup>



**10%** of kids have problems with their working memory. **75%** of kids ages 5-12 with poor working memory will struggle in math and language.<sup>4</sup>

## Signs your child may have low working memory

- The child has a hard time following instructions.
- The child seems like he's daydreaming and not paying attention.
- Both can be the result of a child's working memory literally running out of space – the post-it note is full.



## What can parents do?

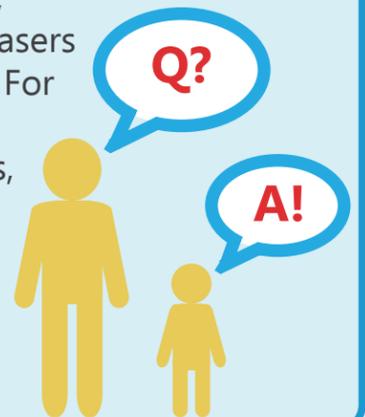
The good news is you can improve your child's working memory.

**Computerized games:** The working memory games created by TVOKids.com and the more intensive Jungle Memory program showed improvements in the working memories of children using those resources.<sup>5</sup>



### Verbal word games:

Verbal word games, riddles and brain teasers also train the brain. For example: Q: "What gets larger as it eats, but smaller as it drinks?" A: "A fire".<sup>7</sup>



**Pencil and paper games:** Crossword puzzles, word scrambles, word search puzzles and Sudoku puzzles help train the brain to use working memory more efficiently.<sup>6</sup>



For more information: <http://tvoparents.tv.org/article/improve-your-childs-working-memory>

<sup>1</sup>Alloway, Tracy Packiam, Improving Working Memory: Supporting Students' Learning. Sage, 2011, 1.

<sup>2</sup>Ibid., 7.

<sup>3</sup>Alloway, Tracy Packiam, Gathercole, S.E, Kirkwood, H.J., & Elliott, J.E. "The cognitive and behavioural characteristics of children with low working memory." *Child Development*, 80. March/April 2009, 606-621.

<sup>4</sup>Alloway, Tracy Packiam & Elsworth, M. "An investigation of cognitive skills and behavior in high ability students." *Learning and Individual Differences*. 2012.

<sup>5</sup>Zack Hawes, a researcher at the University of Toronto's Ontario Institute for Studies in Education (OISE), conducted a study that TVOKids.com games found that two educational games on TVOKids.com improve working memory. This is based on researching the impact of the online games *Rabbit Frog Rabbit* and *Hop Frog Hop*. <http://tvoparents.tv.org/article/games-improve-working-memory-learning-study-finds>

Tracy Packiam Alloway, Vanessa Bibile and Gemma Lau published a research paper that found that the Jungle Memory online program (<http://junglememory.com>) improved the working memory of children. Alloway, Tracy Packiam, Vanessa Bibile and Gemma Lau "Computerized working memory training: Can it lead to gains in cognitive skills in students?" *Computers in Human Behaviour*, 2013, 632-638.

<sup>6</sup>Alloway, Tracy Packiam. *Training Your Brain For Dummies*. Wiley Publishing, November 2010. 15-23.

<sup>7</sup>Ibid., 18 and 22.