



# Mathematics and Memory

Rachel Marler  
University of Hawai'i West O'ahu



## Abstract

Memory and recognition play a crucial role in mathematics. Pattern recognition, active working memory, and the memory of rules are all important memory factors when it comes to the study of mathematics. When students are faced with a math problem, they must be able to recall knowledge from their long-term memory in order to know the proper rules and steps required to accurately solve the problem in front of them.

## Introduction

There are many important factors that play a role in how children work with numbers. One of these factors is the working memory. Memory is thought to have a significant impact when it comes to thinking and working with numbers, but just how important is it? Does a child need to have a good memory in order to be good at math? Understanding the role memory plays in mathematics is crucial for teachers to recognize in order to help students learn and comprehend mathematics to the best of their ability.

This research will focus on just how important memory is when it comes to mathematics, and whether having a good working memory really affects math competency and understanding.

If memory plays an important role in mathematics, then it is crucial for teachers to recognize and incorporate it into the classroom in order for students to reach their full mathematical potential.

## Research Design & Data Collection

My research on mathematics and memory focused on answering the question of whether or not having a good working memory affects math competency. Research was conducted using several online resources as well as journal articles from the National Council of Teachers of Mathematics website.

## Results

This research led me to discovering the three different types of working memory, each of which play a role in mathematics when it comes to children. The three types of working memory are as follows:

**Sensory Memory:** This type of memory acquires the memory that is coming in through the senses. It is a very brief memory.

**Short-term Memory:** This memory holds the information of which a person is currently thinking or aware of. It can hold about 7 items for 30 seconds without any type of rehearsal or reviewing.

**Long-term Memory:** Unlike the other two types of memory, long-term memory is not limited and does not diminish quickly. Informational knowledge is held indefinitely. This form of memory is used the most when it comes to math. Long-term memory is what helps students remember what steps to take, and in what order, when solving a mathematical problem.

## Discussion

Researchers have been examining the aspects of the brain that are involved when it comes to children thinking with numbers. Most researchers can agree that there are a few different factors that all play a role in affecting the mathematical competency of children. Some of these factors include; memory, language, higher order cognition, and attention. Memory has been found to have a direct impact on children and math. There are three main types of memory that are forms of the working memory. Those include sensory memory, short-term memory, and long-term memory. There are also two more specific types of memory that especially play a role in mathematics. Those are called factual and procedural. Factual memory is the type of memory that allows the brain to remember basic math facts, and procedural memory is used to remember step by step ways to conduct more difficult mathematical problems, such as long division for example.

## Conclusions

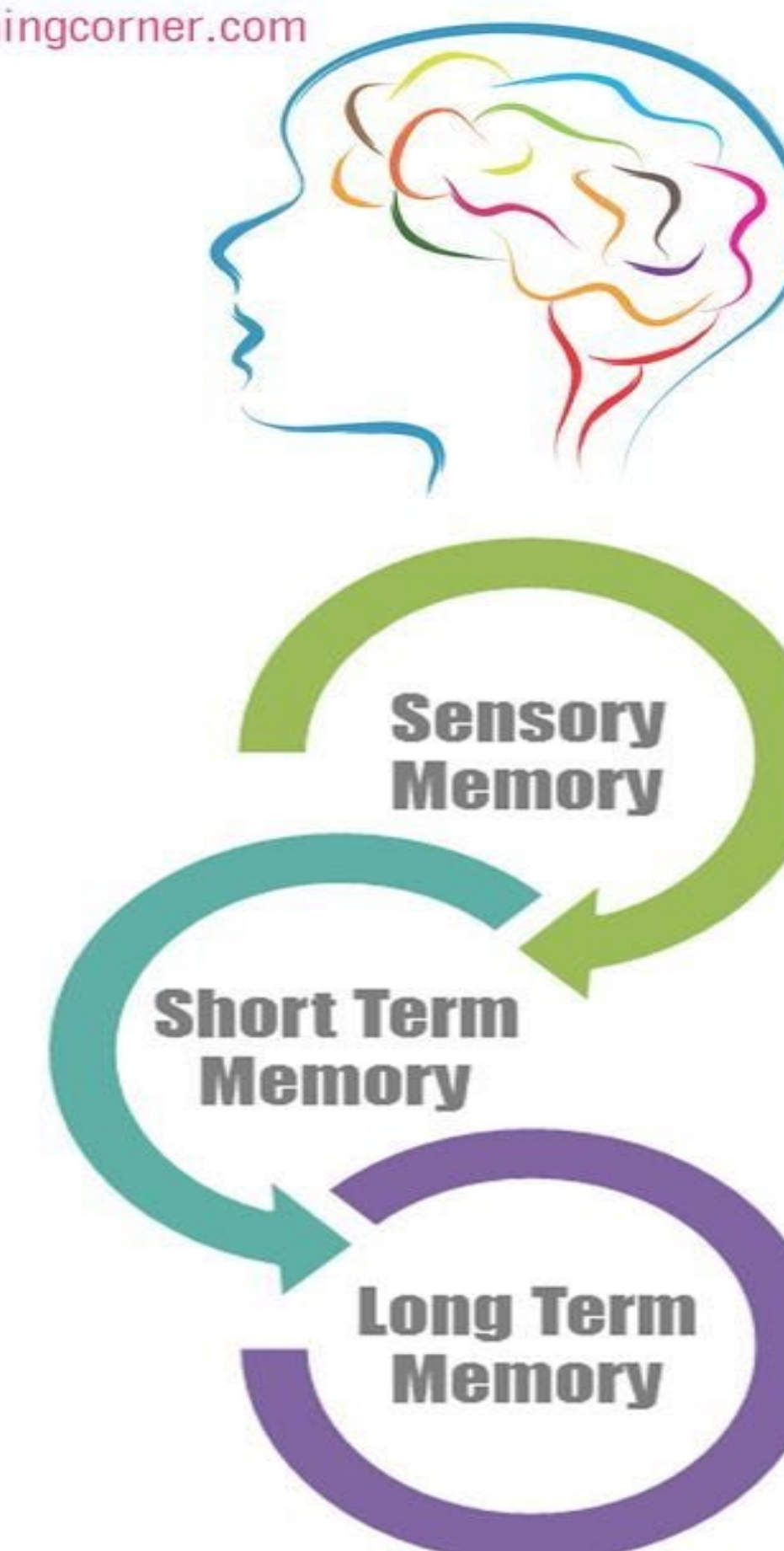
Memory is absolutely an important part of mathematics, specifically when it comes to children. The three types of memory, sensory, long-term, and short-term, all play their own unique roles. While memory is very important for mathematical competency, it is not necessarily the most important. In order to give students their best shot at comprehension, teachers must consider many different factors during mathematical instruction. Focusing specifically on memory has not been proven to be exceptionally helpful when it comes to student comprehension of mathematics.

## References

<https://www.pbs.org/wgbh/misunderstoodminds/mathbasics.html>  
<https://www.memory-key.com/research/topic/mathematics>  
<https://math.stackexchange.com/questions/238993/is-memory-unimportant-in-doing-mathematics>  
<http://www.scielo.org.za/pdf/sajce/v5n1/03.pdf>

### 3 Types of Working Memory

ilslearningcorner.com



**Sensory Memory:** Sensory memory acquires the information coming in through the senses.

**Short Term Memory:** Memory that holds about seven items for 30 seconds without any rehearsal or reviewing.

**Long Term Memory:** Unlike sensory and short-term memory, long-term memory is not limited and does not deteriorate quickly.

## Contact

Rachel Marler  
University of Hawai'i West Oahu  
Rachel31@hawaii.edu