

One of the harder things parents have to do when it comes to their child's schooling is to understand a new method of learning. As the Singapore Math Method gains popularity, it's starting to be used in more schools across the nation, leaving more parents to figure out what this method is all about. A close look at the philosophy and framework of Singapore Math can make it easier to understand what's going on in your child's classroom.

## **The Singapore Math Framework**

The framework of Singapore Math is developed around the idea that learning to problem-solve and develop mathematical thinking are the key factors in being successful in math.

The framework states: "The development of mathematical problem solving ability is dependent on five inter-related components, namely, Concepts, Skills, Processes, Attitudes and Metacognition."

Looking at each component individually makes it easier to understand how they fit together to help children gain skills that can help them solve both abstract and real-world problems.

### **1. Concepts**

When children learn mathematical concepts, they are exploring the ideas of branches of math like numbers; geometry; algebra; statistics and probability; and data analysis. They're not necessarily learning how to work the problems or the formulas that go with them, but rather gaining an in-depth understanding of what all of these things represent and look like.

It's important for kids to learn that all of math works together and that, for example, addition doesn't stand by itself as an operation, it carries on and is a part of all the other math concepts as well. Concepts are reinforced using math manipulatives and other practical, concrete materials.

### **2. Skills**

Once students have a solid grasp of the concepts, it's time to move on to learning how to work with those concepts. In other words, once the students have an understanding of the ideas, they can learn the procedures and formulas that go with them. This way the skills are anchored to the concepts, making it easier for students to understand why a procedure works.

In Singapore Math, skills don't just refer to knowing how to work something out with pencil and paper, but also knowing what tools (calculator, measurement tools, etc.) and technology can be used to help solve a problem.

### **3. Processes**

The framework explains that processes “includes reasoning, communication and connections, thinking skills and heuristics, and application and modelling.”

- Mathematical reasoning is the ability to look carefully at mathematical situations in a variety of different contexts and logically apply the skills and concepts to problem-solve the situation.
- Communication is the ability to clearly, concisely and logically use the language of math to explain ideas and mathematical arguments.
- Connections is the ability to see how math concepts are related to each other, how math is related to other areas of study and how math relates to real life.
- Thinking skills and heuristics are the skills and techniques that can be used to solve a problem. Thinking skills include things like sequencing, classifying and identifying patterns. Heuristics are the experience-based techniques a child can use to create a representation of a problem, take an educated guess, figure out the process to work through a problem or how to reframe a problem. For example, a child may draw a chart, try to guess and check or solve parts of a problem. These are all learned techniques.
- Application and modelling is the ability to use what you’ve learned about how to solve problems to choose the best approaches, tools and representations for a certain situation. It’s the most complicated of the processes and takes a lot of practice for children to create math models.

### **4. Attitudes**

Children’s mathematical attitudes are what they think and feel about math. Attitudes are developed by what their experiences with learning math are like.

So, a child who has fun while developing a good understanding of concepts and acquiring skills is more likely to have positive ideas about the importance of math and confidence in his ability to solve problems.

### **5. Metacognition**

Metacognition sounds really simple, but is harder to develop than you might think. Basically, metacognition is the ability to think about how you are thinking.

For kids this means not only being aware of what they are thinking, but also knowing how to control what they are thinking. In math, metacognition is closely tied to being able to plan how to solve a problem, explaining what was done to solve it, thinking critically about how the plan works and thinking about alternatives way to approach the problem.

The framework of Singapore Math is definitely complicated, but it's also definitely well thought out and thoroughly defined. Whether you're an advocate for the method or not so sure about it, a better understanding of the philosophy is key in helping your child with math.

