

## Maths Teaching/Learning at St Joseph's

### Why does St Joseph's use Singapore Maths?

- ❖ Singapore's results
- ❖ It creates students who are proficient in the mathematics required in today's world.
- ❖ Problem solving is the heart of the program.
- ❖ Understanding, thinking, reasoning, visualisation, and computational fluency are all integral parts of the program.

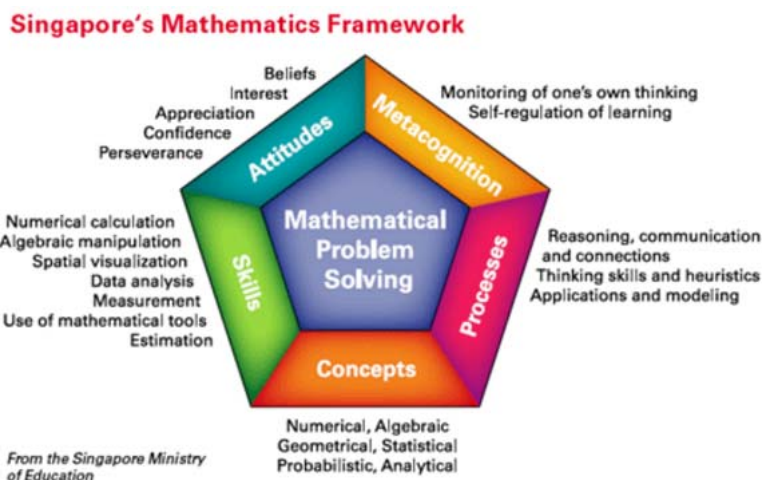
### What is Singapore Maths's methodology?

Singapore maths focuses on fewer topics with the intent of learning these topics thoroughly to mastery before moving on. In this way, the understanding is deep, and can be applied in new and different situations instead of constantly being relearned at a basic level. The purpose is to create critical thinkers, problem solvers, not just procedural mathematicians. Singapore Maths is known for a learning sequence that encompasses concrete, pictorial and abstract experiences with a concept.

<b>Concrete</b> This is done through a hands-on approach using concrete materials as a guide for students.	<b>Pictorial</b> This is done by moving to a picture stage in which drawings are used to model problems.	<b>Abstract</b> In the abstract stage only numbers, notation and symbols are used.
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Problem solving is at the heart of Singapore Maths. The graphic below illustrates the mathematical elements that integrate with and support mathematical problem solving in the Singapore Maths program.



The Singapore Ministry of Education (2003)

Four areas comprise the Singapore Maths pedagogy. In addition to the concrete-pictorial-abstract approach to learning, 'visualisation' of mathematics is key to this methodology. Visualization is the ability to see and understand a problem situation (Yin 3). 'Maths is thinking' is the aspect of the methodology that promotes deep understanding of maths concepts, as opposed to rote memorization. Posing 'thinking' questions to students is one of the ways Singapore Maths promotes 'maths is thinking.' 'Gradual Release' is the way a teacher scaffolds learning so that ultimately, students are able to solve problems independently.

### What are other key aspects of Singapore Maths instruction?

**Number Bonds** Number bonds are different pairs of numbers which make up the same number. For instance, the number bonds for 8 are 1+7, 2+6, 3+5 and 4+4. A number bond is typically represented using a picture consisting of 3 circles connected by 2 lines.

**Bar Model Drawing** Means translating a word problem into diagrams or models. This technique not only provides a powerful method for solving problems, but also serves as a link to algebra.

**Base 10** Students learn the process of adding and subtracting using base 10 strategies. This formative concept allows students to understand these simple operations.

Ogden School District

### What are the materials used in instruction?

At St Joseph's we use many resources to support our teaching of mathematics. One of our main resources is 'Maths No Problem' (MNP). Currently, this is one of only two schemes that have been approved by the DfE. There are two books that are used together, a textbook and a workbook.

The year is divided into two parts so there is a textbook and workbook A and B for each year. Students use concrete materials, play games, and work with enrichment and/or reteaching materials to best learn mathematical concepts and skills. The reteaching materials provide further practice for students to develop mastery of a skill or to help them foster a visual and deeper understanding of a concept.

Enrichment materials provide extension and challenge questions for students who would benefit from expanding their conceptual understanding around the big ideas of a chapter.

### What can you expect to see in practice that comes home?

- Use of visuals and language
- Standard algorithms
- High level questioning

### **What if my child brings home maths practice he or she is unsure how to do?**

Generally speaking, maths practice brought home is that which has already been learned in class and should be able to be done independently. Occasionally, a child may encounter a challenging problem that aims to stretch his or her thinking, however, if a child becomes frustrated in working with a particular problem, that problem should be put aside to discuss in class with the teacher the next day.

Parents and tutors should not provide answers, as children are encouraged to work through difficult problems with guidance of coaching and not feel that practice has to be completed with perfection. If a child repeatedly has difficulty with maths homework, please speak to the class teacher.

### **How can parents help their children with maths?**

- Engage in conversations about what they are learning in maths: Ask children to explain what they did in maths today. Can they show it to you with objects? Can they draw an example of what they did? Can they compute accurately and check their work?
- Ask children to find maths around them. How can they use maths everyday? Why is this important?
- Encourage children to create maths stories and have others solve them. Make it fun!
- Play maths games at home.
- Stay involved. Check your children's homework to make sure that they are always ready for the independent work that has been sent home.
- Begin helping your child with a question: What is a good way to begin understanding this problem? What do you know about the problem? What is the problem asking? How is this problem you are struggling with like those you have answered before? How is it different? Does your solution match your original estimation?
- Use resources available to you, including your child's teachers. Parents and teachers must work together to build a strong foundation for mathematics.

### **What are steps students learn to approach problem solving?**

1. **Look for a way to start understanding the problem.** What do you know? Who is involved? What is involved? What do you not know?
2. **Answer the question with a blank where the answer will go.** (Steven has \_\_\_\_\_ apples.)
3. **Draw what you know.** Label and identify everything.
4. **Think about what you know.** Consider everything you know. What is the problem asking? Have you seen another problem like this before?
5. **Estimate to predict.** Once you identify the operations you need to use, you can predict a reasonable answer.
6. **Write your number sentence (equation) and solve.** Can you see clearly that the solution is correct? Can you prove that it is correct?

7. **Check your work.** Does it match your estimate?


8. **Add your solution to the blank in the answer sentence from step #2.**

If you want to see MNP in action, or gain a greater insight into the fundamental principles, there are some video clips for parents:

<https://mathssnoproblem.com/en/parent-videos/>


**K52 Problem of the Day**  
Thursday 8<sup>th</sup> March 2018

1 A barrel contains 13 1280 ml of water.



The water is shared equally between 5 buckets.  
How much water is in each bucket?


2 A piece of ribbon is 5 metres long.



Gina and Liam each use part of the ribbon to wrap a present.

- Gina uses 1.6 metres
- Liam uses 256 cm

The remaining ribbon is cut into 7 pieces of equal length.  
How long is each piece of ribbon?



**K51 Problem of the Day**  
Tuesday 6<sup>th</sup> March 2018

1 Complete the missing numbers.


$60 \div 5 = \square$

$6 \div 50 = \square$


$60 \div 5 \div 50 = \square$

$60 \div 5 \div 50 = \square$

2 James has £68



Mo has £42



James gives Mo some money.  
James and Mo now have the same amount of money.  
How much money does James give Mo?

