



$$\square + \square = 30$$

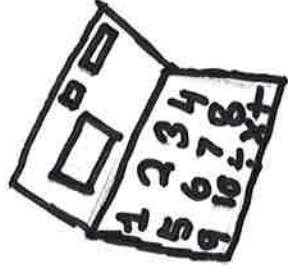
Sandringham



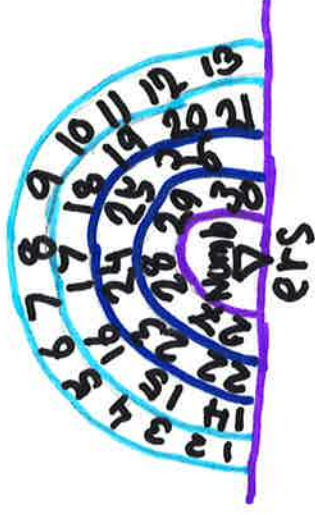
Maths explained

Illustrated by
Urshita MC

$$\square + \square = \square$$

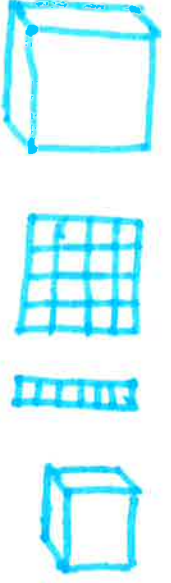


$$1 + \frac{9}{3} = 2 \times 3$$



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$$10 + 20 = 30$$





Sandringham Pre-School



Sandringham Primary School

This is a reflection of the Sandringham approach to the teaching of mathematics in light of the recent study trip attended. The booklet is designed to be used by School leaders and teachers considering a mastery approach to maths. The information in here explains how we have developed a successful curriculum for the children of Sandringham. It is a personal account of our School's journey, please be mindful that each School is different.

Katie Boyles.



① Commitment and Support: SLT have to be Committed and see the benefits of a mastery approach. Our maths vision (the belief that all children are Capable mathematicians) - achievement for all is important and a Shared belief. A belief and a vision alone are not enough - how will this be achieved?



Leadership

② Direction: SLT know what they are trying to achieve, why and how. The same shared language on a mastery approach buzzes around the school. Research and books read by SLT are all available in the Staff library. The "how" of developing our Curriculum is clearly set out in a 2-year plan written by AHT mathematics.



③ Support and training: Support is needed for all staff - they will need convincing it is the right thing for school and then will need help. SLT have been open, research and evidence is discussed. Training, CPD and lesson study. Visits to and from other schools to act as critical friends. Support in planning and teaching lessons.

⑤ Time and money: Buying resources and training has a cost involved. Remember the purpose, look at the research and think about the impact. Time - It does take time to implement and it is not a quick-fix. Teachers, pupils and Parents will need time to adopt and reflect. Patience!

④ A common understanding of mastery: SLT and teachers have a shared view of what mastery looks like in a classroom - a consistent approach. Clear, shared expectations when observations and book looks take place - consistency. A clear understanding of the structure of the maths lesson: Problem Solving approach, C-P-A, importance of mathematical language, Manipulatives, Children displaying mathematical thinking.



⑤ Jean Piaget.

Independent. Piaget covers aspects of all the theorists mentioned and includes the importance of "struggle". Children need to be finding learning challenging to discover new things. New ideas will be accommodated with: time, exploration, talk, conceptual understanding and concrete resources.

During independent practice, children should be challenged to put their understanding into practice.

④ Richard Skemp.

Guided practice, independent and reflection. Skemp discussed how old and new learning is linked together. Building Schemata. Through immediate teacher marking, children are challenged to make links between old and new learning.

Reflections provide the opportunity for relational and conceptual understanding to be explained by children.

5 important theorists and how they link to the 5 parts of a lesson.

① Zoltan Dienes.

The Anchor task. Dienes describes 6 stages of learning. Stage 1 states how children should be allowed to explore and discover for themselves. This theory underpins the principle and purpose of the anchor task. Children should not be introduced to something new in a structured/formal way.

② Lev Vygotsky.

The anchor task and throughout.

Vygotsky described us as social creatures with a need to interact with each other. Children need to internalise thinking and restructure thoughts. Children should be talking throughout the lesson to each other and the teacher. Reflection time is an opportunity for children to articulate understanding verbally and written.

③ Jerome Bruner.

Anchor task and throughout.

The C-P-A approach moves children from concrete resources, pictorial representation and finally to abstract.

New learning will need manipulatives to support understanding. Once this is achieved, pictorial/visual images will be used. Ultimately children need to be working at an abstract level.



① Our children are the same with similar backgrounds and experiences in some cases. There is no reason why our children cannot excel in maths as the children in Singapore do. Our curriculum may have more content, however much is the same. The approach used to teach maths can be adapted and implemented here.

What we saw in Singapore

⑤ The simplicity of the lesson and the focus being "maths" lessons are not fancy, they are engaging and provide depth. Technology was used to share learning and as assessment. The core values of the curriculum were clear and maths was a vehicle in which to teach them.

④ Problem solving and heuristics - children were engaged immediately with the anchor, they were displaying multiple methods and were able to identify which heuristic they should use to attempt a problem. All teachers have high expectations and children have high expectations of themselves as learners. They want to achieve, intrinsic motivation is high.

② Lesson Study - How powerful lesson study is in improving teaching and learning. The engagement from staff and the openness. No worry or "fear" of SLT being involved. The focus was entirely on the children.

③ Research - The curriculum and pedagogy is rooted in research, nothing is done without being considered based and encourages reflective teachers - what went well/didn't and how this relates to pedagogy before moving on.

Reading research - widens perspectives about teaching. There isn't a right/wrong way.



① Heuristics - developing a clearer understanding of heuristics as strategies children can use to solve problems.

Feedback to staff and the begin to plan heuristics into maths lessons. Based on the work of George Polya

Our next steps:

and his 4-part model to maths.

⑤ Develop and embed an awareness of theoretical understanding. We need to be the experts. All staff can explain why we take this approach and the impact it has on children's learning.

② Struggling learners - Helping and supporting children who need further intervention other than in-class differentiation.

The Singapore model of foundation maths is effective in Singapore. Now thinking about how this can be adapted and implemented as a support

“Support for beginners” model to be studied to ensure we are providing all possible scaffolding from the beginning

③ Lesson Study - Continue to develop as a model of CPD. Develop the recent project based on the Japanese model. In Singapore Lesson Study makes up a huge amount of CPD. CPD needs to happen with children, to improve you need to see real teaching in real circumstances.

④ Unpacking a lesson to focus solely on the maths - NOT delivery style. Develop a rubric for observation and lesson study designed on the elements of a maths lesson and how this is linked to research. Intelligent Practice.