

Helping your child with Maths

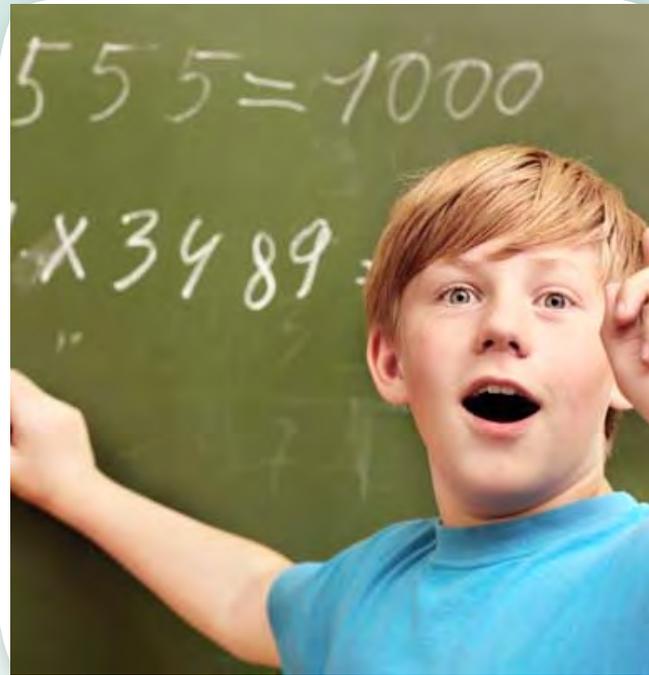
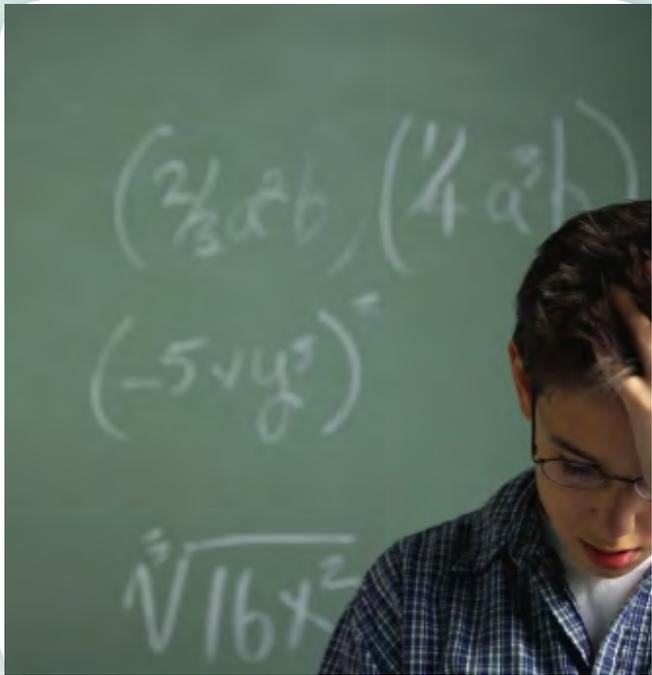
January 2017



Aims

- To understand the importance of attitude.
- To look at how children learn Maths.
- To provide some ideas for support your child with Maths at home.





Which best represents how you feel when tackling a Maths problem?

Fixed vs. Growth Mindset

Learners with a fixed mindset:

- Believe that you either have ability or you don't.
- Are reluctant to take challenges.
- Are worried about making mistakes.
- Prefer to stay in their comfort zones.
- Think it is important to see intelligent in front of others.

Learners with a growth mindset:

- Believe that effort creates success.
- Believe that a skill and ability can be increased over time.
- View mistakes as an opportunity to develop.
- Are resilient.
- Thinks about how they learn.



Growth Mindset and Woodside

- We do not use ability grouping during lessons.
- Lessons consist of either:
 - An open-ended task – all children do exactly the same task, but take it as far as they can.
 - Levelled challenges – children choose which challenge is most appropriate to their current confidence within that Mathematical concept.



Week of Inspirational Maths

 **youcubed**
at Stanford University



Believe in Yourself



Back at home!

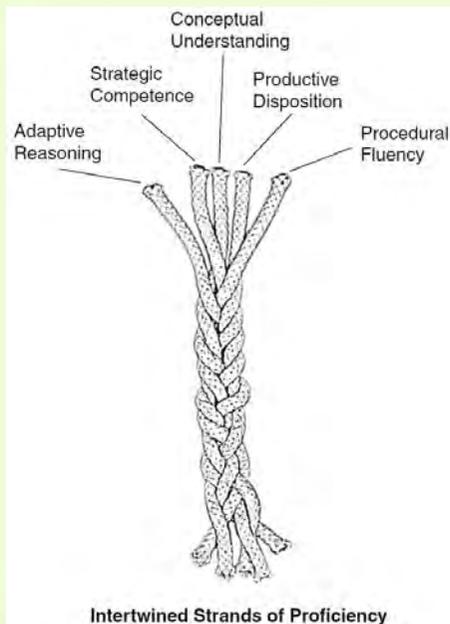
- DO:
 - Get excited about Maths and your child will get excited too.
 - Use the word 'yet'.
- DON'T:
 - Tell your child that you are hopeless at Maths or are no good at.



How do children learn Maths?



Mathematical Proficiency



- **Conceptual understanding** (understanding) – comprehension of mathematical concepts, operations and relations.
- **Procedural fluency** (computing or calculating) – skill in carrying out procedures flexibly, accurately, efficiently, and appropriately.
- **Strategic competence** (applying) – ability to formulate, represent, and solve mathematical problems.
- **Adaptive reasoning** (reasoning) – capacity for logical thought, reflection, explanation, and justification.
- **Productive disposition** (engaging) – habitual inclination to see mathematics as sensible, useful, and coupled with a belief in diligence and one's own efficacy.



But first... Number Sense!

We need to first develop a **sense of number**.

Children need to understand our number system, starting with counting numbers, identifying numbers, and understanding quantity. In addition children need to build an understanding of how our numbers work and fit together. This includes exploring place value and comparing and ordering numbers. Then applying this understanding in different contexts.



Number Sense!

Repeated experiences build understanding and **fluency** with numbers. These experiences help expand understanding and learn new concepts. A strong number sense is vital for future understanding or more complex Maths concepts.



Activities to Develop Number Sense



Counting

- Counting out loud starting at 1 and building higher and higher.
- Take turns counting in 1's.
- As counting develops, count in 2's, 5's and 10's.
- Show children what numbers look like – point to each as the number is said.
- Practice one-to-one counting with objects.



Matching Numbers to Quantities

- Match two different types of objects together, and a domino that shows 5 dots.
- Build towers with Lego to create a number.
- Work up to showing quantity with more than two types objects. *(photo on left)*
- Have a range of items including dice, dominoes, number foam numbers, counters and other toys (e.g. cars, Lego, animals, etc.).
- Match number cards from a card deck or game of Uno with dots on dominoes. Find every number combination on the dominoes. *(photo on right)*



Ordering Numbers

- Provide opportunities with using things that puts numbers in order for us, for example rulers and tape measures.
- Build Lego towers by putting the pieces together in an order written on the bricks.
- Once built, remove one brick without letting your child see and then ask them what number is missing.
- Puzzles are simple and easy to create. Take an old puzzle and write numbers on the back of each piece.
- Ordering toy cars based on the numbers written on them.
- Dot to dots.



Place Value

- Practice making groups of ten things, e.g. straws, beans, counters or any small objects.
- Practice counting in 10's to count groups.
- When including a non-complete group of 10, make sure that groups are counted first and then singles, e.g. 10, 20, 30, 31, 32, 33, 34, 35.
- Use bundles of 10 straws and single straws, or 10p and 1p coins, to represent numbers. Discuss how the group of 10 has ten ones put together.
- Ask questions like “How many ones are there?” or “How many groups of ten?”. Make sure they understand what each number within the number stands for, (i.e. the 1 in 18 is a ten and not a one).



Place Value Game: Nice or Nasty

This is great for creating and reading two-digit numbers, order to win you must understand place value.



You need: a pack of playing cards (remove the picture cards), paper and pencil. Ace counts as a one.

Each player draws two boxes side-by-side on a piece of paper, each box big enough to hold a playing card.

Decide whether you are going to make the biggest or smallest number. Take it in turns to turn over the top card and place it on one of your boxes. When each player has placed two cards, read these out as a two-digit number – 2, 8 is twenty eight. The winner is the player with the largest or smallest number as previously agreed.

The 'nasty' version is when you choose to play a card on your own board or on your opponent's.



Ideas taken from **Maths for Mums and Dads**, Eastaway, R. and Askew, M. (2010)

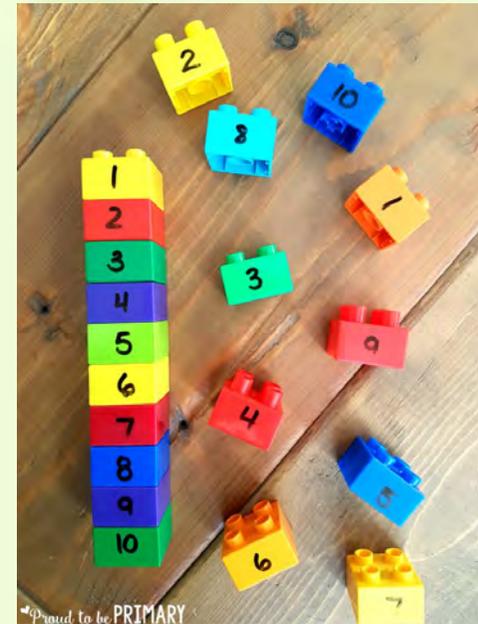
Reading and Writing Numerals

- Build numbers with playdough.
- When playing games like Snakes and Ladders, your child to read the number they land on.
- Spot numbers when you are out and about.



Counting on and back

- Play games with small objects and decks of cards where counting on is needed.
- Use small objects to count on or back from a number given.
- Put numbers in backwards order. Take the ordering activities from earlier and reverse them.



Counting On Game: Twenty

Two players take it in turns to count up from 1 to 20, counting one, two or three in their turn. Each player can decide how many to count during their turn.

The player who ends up having to say 20 loses. So the game might go like this:

Ali: One, two.

Jake: Three.

Ali: Four, five, six.

Jake: Seven, eight.

Ali: Nine, ten, eleven.

Jake: Twelve, thirteen, fourteen.

Ali: Fifteen, sixteen...

Jake: (smiles as excitement grows) seventeen, eighteen, nineteen!

Ali: Twenty.



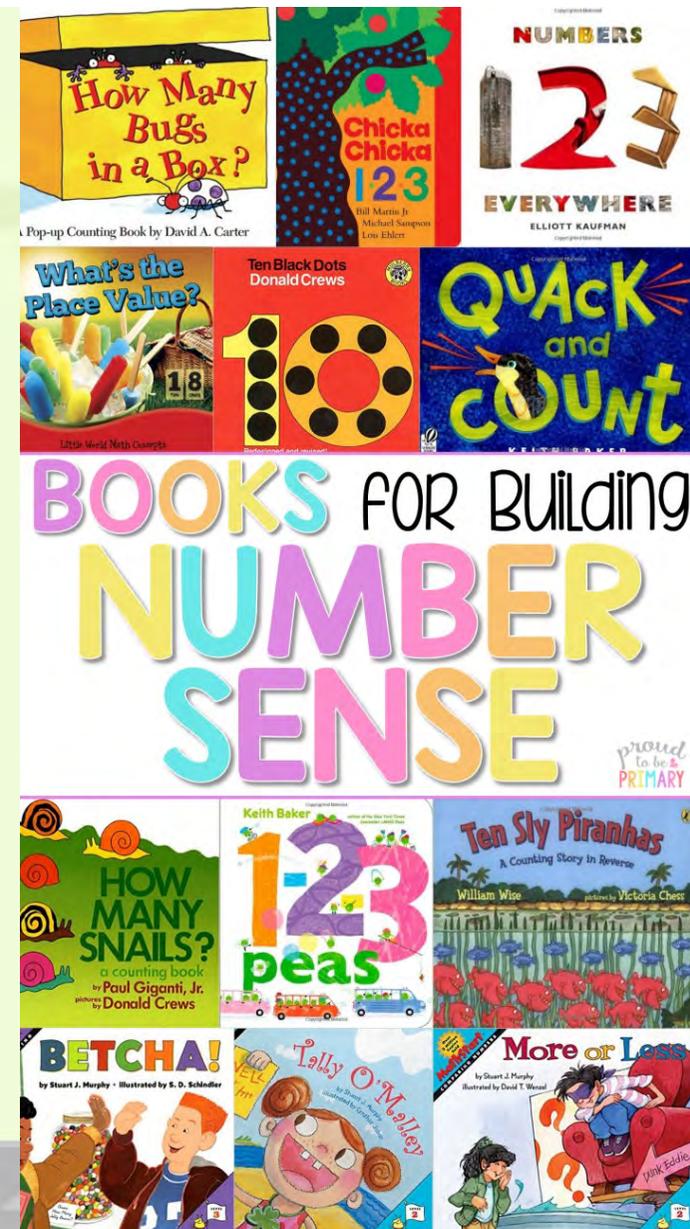
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More Ideas

- **Estimating:** provide opportunities for your child to guess how many things they see in their day to day lives. Ask prompting questions to encourage this thinking. Make sure they know they are estimating and that these are just guesses. Stress that estimates do not need to be exact but they should be thoughtful.
- **Comparing numbers:** As familiarity with numbers grow, so does an ability to compare numbers with each other. As questions about which number is bigger, smaller or the same.
- **Books:** There are a range of picture books available that are Mathematical.



<https://proudtobeprimary.com/building-number-sense-to-20/>



Helping at Home

Dos and Don'ts



Some Dos...

- **Play (Maths) with your child:** games are full of Maths, and are the ideal way to engage a child in Mathematical thinking.
- **Let your child win, or be 'better than you':** you can introduce Mathematical ideas even when you're letting your child 'win' at something that is nothing to do with Maths.
- **Make Maths a casual part of what you do while you're doing something else:** find ways of sneaking Maths in to the things your child does casually.
- **Do lots of hands on Maths:** cash, clocks and cooking.
- **Recognise that there's more than one way of doing calculations:** whilst you may have learnt one method per operation at school, we encourage children to try different methods and choose which works well for them.



Ideas taken from **Maths for Mums and Dads**, Eastaway, R. and Askew, M. (2010)

Some Dos...

- **Be a geek:** Most of us are secret geeks, and the biggest geeks of all are children. They love obsessive, repetitive tasks, abstract games and getting excited about things we don't understand.
- **Be an actor:** Get excited about Mathematical ideas, and your child will get excited too. Who knows, if you fake it for long enough, you might actually start genuinely getting excited yourself – it can be infectious!



Ideas taken from **Maths for Mums and Dads**, Eastaway, R. and Askew, M. (2010)

And Some Don'ts...

- **Don't expect them to 'get it' after you've explained it once:** It can take a long, long time for a mathematical idea to become second nature. It's also normal for a child to 'get it' one day, and then in a different context, not know how to find the answer.
- **Don't tell them that you are hopeless at Maths:** this can carry a more insidious message "I was hopeless at Maths and look, I'm a successful adult now, so clearly being good at Maths is not important." Children pick up on these messages, and the main effect is to switch them off Maths. They expect it to be something they won't enjoy, that will be filled with failure, and ultimately won't be of any use to them.



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Maths Props

For Mums and Dads



Maths Props

- **A prominent clock:** if you have an analogue clock AND a digital clock then so much the better, since comparing and understanding the times on the two clock becomes an everyday habit.
- **A traditional wall calendar:** a good way of getting familiar with counting days, but they also have subtle patterns, for example one of the columns will be the 7 times table.
- **Board games that involve dice and spinners:** helps with counting and also builds an understanding of chance.
- **A pack of traditional playing cards** and a few games up your sleeve (such as Snap and Blackjack).
- **A calculator:** not only useful for calculating on, but also for playing games.



Ideas taken from **Maths for Mums and Dads**, Eastaway, R. and Askew, M. (2010)

Maths Props

- **Measuring jugs with scales:** jugs that show pints as well as litres provide an instant, visual conversion. Collect empty shampoo bottles or water bottles so your child can create their own measuring jugs.
- **Dried beans, macaroni or Smarties:** these are useful for counting large collections, dividing them into twos, threes and so on.
- **A tape measure and ruler:** Involve your child when measuring up for furniture, new curtains and DIY. If you hold the zero, they have to do the reading.



Ideas taken from **Maths for Mums and Dads**, Eastaway, R. and Askew, M. (2010)

And some you might want to invest in...

- **Fridge-magnet numbers and symbols:** an way of bringing Mathematical equations and questions into the home. Try leaving a calculation on the fridge after your child has gone to bed. Leave it there as a mystery waiting to be solved when they then come down for breakfast.
- **Old-fashioned kitchen scales** *where the ingredients are balance by weights:* not only is this a great, tactile way of adding numbers (or fractions if you have old weights), it also introduces the idea of an equation, where the things on one side of the scales are 'equal to' the things on the other side.
- **A dartboard (you may want a Velcro version!):** not only does it teach addition and subtraction, but also doubling and trebling.



Ideas taken from **Maths for Mums and Dads**, Eastaway, R. and Askew, M. (2010)

And some you might want to invest in...

- **Games with unusual dice**
- **Dominoes**: illustrates combinations (in this case, all the ways of combining 0 to 6). Also used for toppling games.
- **Guess Who?**: illustrates how to divide things into categories (men/women, with glasses or without, etc.)
- **An indoor/outdoor thermometer**: good way to introduce negative numbers and allows your child to become accustomed to ideas of freezing, 'below zero' and the negative symbol.



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