MATHEMATICAL PRACTICES

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

How to Help Children Learn Word Problems

Ask your child:

1. What do you already know?
2. What do you need to find out?
3. How can you retell the story problem in your own words?
4. How can you use math tools to solve the problem?
5. How could you draw a picture or model of the problem?
6. Does your solution make sense? Why or why not?

- Encourage children to approach word problems with careful thinking, confidence, and a persevering attitude.
- Encourage kids to learn multiple approaches to solving math problems so that they can choose the approach that works best for them, and so that they develop a full understanding of the concepts before they move on to more challenging levels.
- Encourage children and focus on the reasoning in the math rather than getting a correct answer.
- Help children realize math is not about speed.
- Help children recognize that struggling moments are opportunities for growth. Making mistakes is okay.
- Say, "Let's work and learn together to figure the problem out." when working on math with your child, rather than sharing with your child the idea that you were not good/struggled at math in school or you disliked math or not a "math person."
- Encourage number sense.
- Encourage a growth mindset...the idea that ability and smartness change as you work and learn more.

Math Language That Needs to Expire

Instead of saying…	Say…
borrowing and *carrying*	*trading* and *regrouping*
___ *out of* ___	fraction and attribute
reducing fractions	*simplifying* fractions
How are shapes *similar*?	How are shapes the *same* or *different*?
Reading "=" symbol as "*makes*"	*equals* or *is the same as*
plugging a number into	*substitute values*
top number/bottom number	*numerator/denominator*

Thirteen Rules that Expire (math) – from NCTM (National Council of Teachers of Mathematics) August 2014 (article)
http://www.nctm.org/Publications/teaching-children-mathematics/2014/Vol21/Issue1/tcm2014-08-18a_pdf/

1. When you multiply a number by ten, just add a zero to the end of the number.
2. Use keywords to solve word problems.
3. You cannot take a bigger number from a smaller number.
4. Addition and multiplication make numbers bigger.
5. Subtraction and division make numbers smaller.
6. You always divide the larger number by the smaller number.
7. Two negatives make a positive.
8. Improper fractions should always be written as a mixed number.
9. Improper fractions should always be written as a mixed number.
10. The number you say first in counting is always less than the number that comes next.
11. The longer the number, the larger the number.
12. Please Excuse My Dear Aunt Sally.

Resources:

Book by Jo Boaler *Mathematical Mindset*

- Website: https://www.youcubed.org/

Articles (from youcubed website under "Parents" link)

- 100% is Overrated: People labeled "smart" at a young age don't deal well with being wrong. Life grows stagnant. http://www.theatlantic.com/education/archive/2015/06/the-s-word/397205/
- Memorizers are the Lowest Achievers http://hechingerreport.org/memorizers-are-the-lowest-achievers-and-other-common-core-math-surprises/
- Stereotypes that Distort How Americans Teach Math: Speed doesn't matter, and there's no such thing as a "math person." How the Common Core's approach to the discipline could correct these misperceptions. http://www.theatlantic.com/education/archive/2013/11/the-stereotypes-that-distort-how-americans-teach-and-learn-math/281303/

Article:
Understanding Common Core Style Models from elementary through high school, consistency is key
https://medium.com/i-math/how-common-core-can-prepare-students-518c2fb72e3#.yjto2e88q

Videos:

- Videos by Graham Fletcher:
  - Progression of Multiplication - https://vimeo.com/149428217
  - Progression of Division - https://vimeo.com/153668928
- Youcubed website https://www.youcubed.org/students/
- Conrad Wolfram - How to Teach Math (referenced in book *Mathematical Mindset*)
  - http://www.ted.com/talks/conrad_wolfram_teaching_kids_real_math_with_computers?language=en