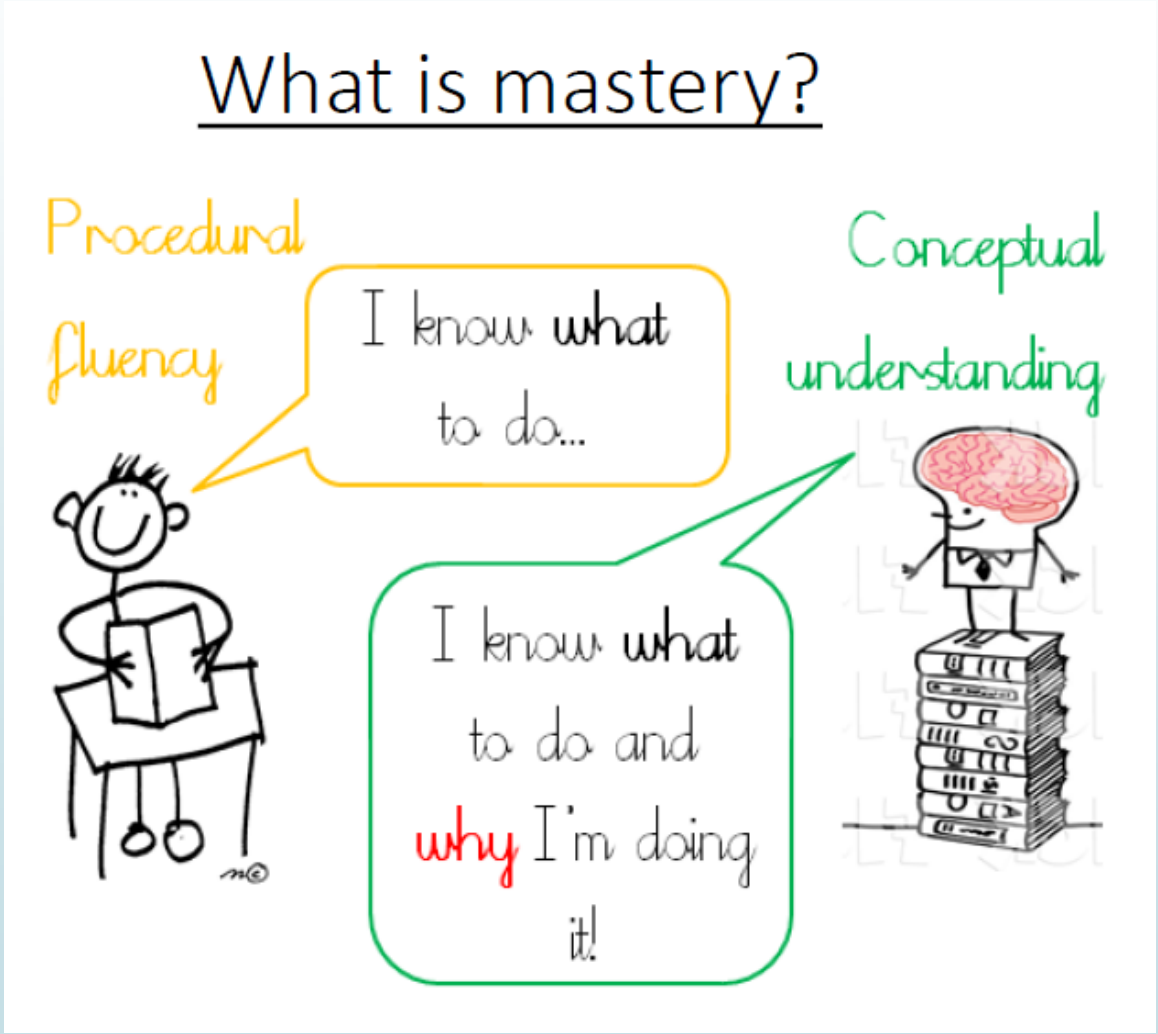
How to help develop your child's mathematical reasoning.

Presented by Dawn Childs- Mathematics Fanatic!

Here at Mawsley, we teach mathematics using the mastery approach

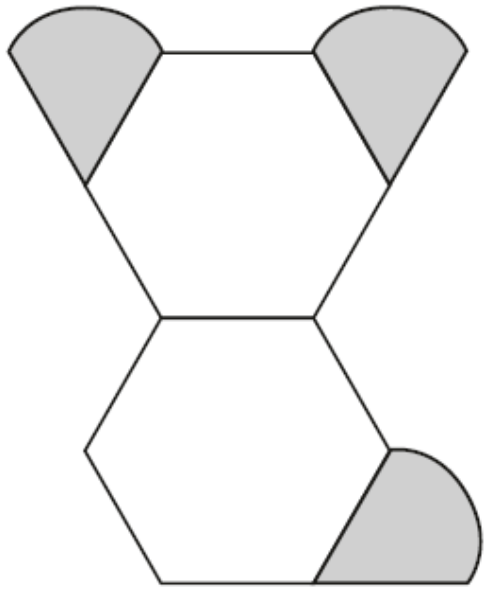


You can't achieve mastery of a concept unless you can reason. So, what is reasoning?

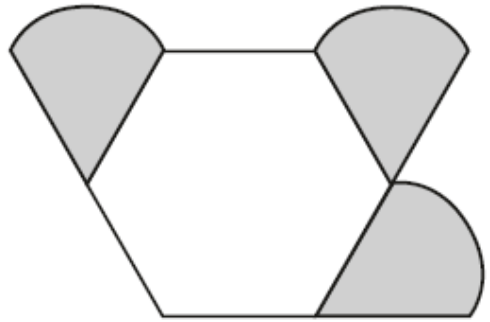
- Mathematical reasoning is the skill that enables a child to make use of all their mathematical skills.
- It helps children make sense of maths, to understand it so that they can use it.

Amina is making designs with two different shapes.

She gives each shape a value.



Total value is 147



Total value is 111

Calculate the value of each shape.

This is a question from the 2018 year 6 SATs. You can't solve this problem unless you can reason.

What is different?
There is one more pentagon so the pentagon is 147-111= 36
So if 111=36+ 3triangles
111-36=3 triangles= 75 so one triangle=25

It requires systematic thinking and being able to explain your thinking

Convince me!

Explain why.

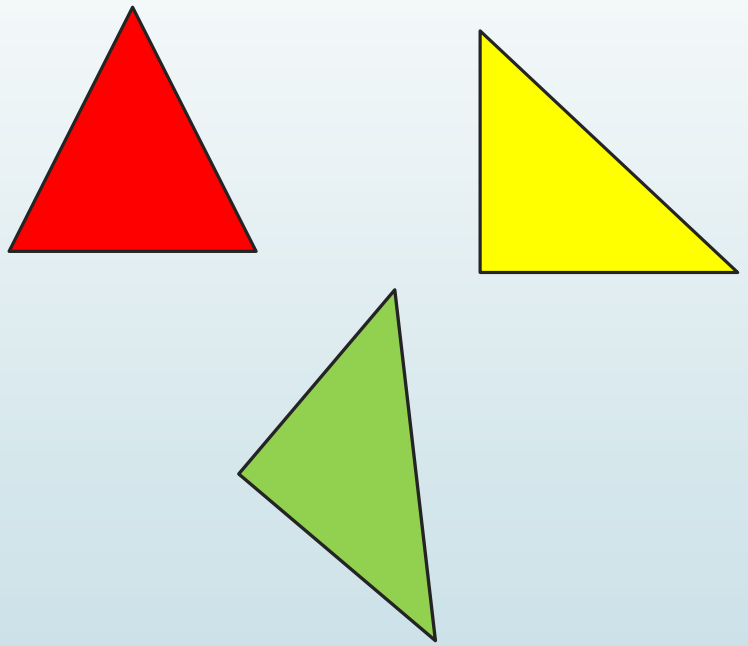
Odd one out.

Do you agree?

True or false?

Prove it!

What do you notice?



These questions/statements promote reasoning.

Examples of reasoning skills

- Justify or argue their point.
- Prove something to be true or not true
- Use logic to solve problems, not just guessing
- Find patterns
- Think about what they need to know to find an answer
- Work backwards (inverse)
- Think about how to do things a better way

Prove something to be true

Harry says, "6/8 is always the same as 3/4"
Is he correct? Explain your answer using diagrams and sentences.

Find patterns

- Making chairs and table from cubes

Working backwards

- Would you rather be bitten by 15% of 120 mosquitoes or 8% of 250 mosquitoes?

Justify or argue their point

- The best way to solve 300 x 9 is to use short multiplication

Using logic

Two lengths of string are cut up into lengths. Which length of string was originally the longest? Explain how you know.

1/3

1/3

Find a better way

How to help at home

- Model your own reasoning- think aloud!
- Be argumentative. Make statements and ask your child to prove you wrong. Ask why- describe, explain, convince, justify, prove
- Talk maths all the time. Live it, love it, explore it in the world around them!

Useful websites

- This has a selection of pictures, number and word puzzles
- http://www.brainboxx.co.uk/a4_resource/pages/puzzleboxx/puzzles/MENU.htm
- https://nrich.maths.org/primary-upper
- Word based riddles and puzzles to figure out!
- https://www.mathsisfun.com/puzzles/
- http://www.folj.com/puzzles/
- This has a variety of activities organised by year group
- http://www.roathparkprimaryschool.co.uk/help-your-child-with-mathematical-reasoning/
- This has online games to develop reasoning and problem solving
- http://www.topmarks.co.uk/maths-games/7-11-years/problem-solving