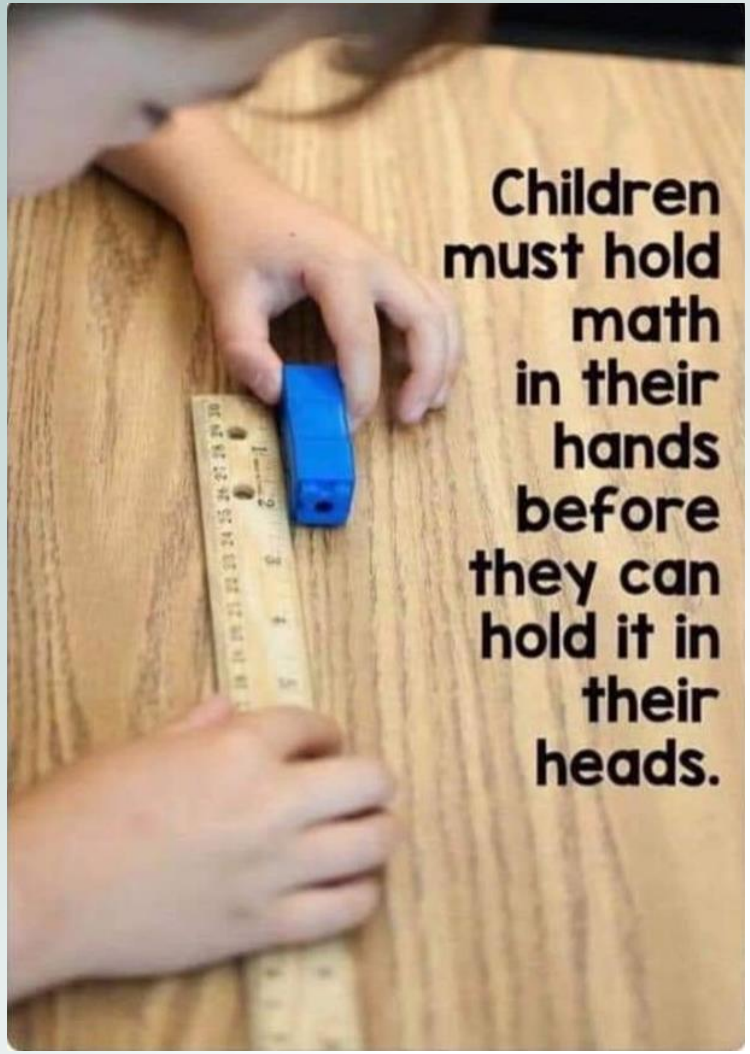
MATHEMATICS

is not about numbers, equations, computations, or algorithms: it is about

UNDERSTANDING.

William Paul Thurston



Aims for tonight

- Help you better understand our aim and approach to teaching maths so you can better support your children
- See some of the methods in action for calculation

What makes someone a good mathematician?

- What do you think?

What are the characteristics of a child who is good at maths?

From the early stages onwards, children and young people should experience success in mathematics and develop the confidence to:

- take risks
- ask questions and explore alternative solutions without fear of being wrong
- enjoy exploring and applying mathematical concepts to understand and solve problems
- explain their thinking and presenting their solutions to others in a variety of ways
- reason logically and creatively through discussion of mathematical ideas and concepts
- become fluent, flexible thinkers able to see and make connections

Mathematicians

- Make mistakes and use them to learn new things
- Are organised and systematic
- Describe, explain and discuss their work
- Keep going when it is difficult
- Look for patterns and connections
- Have imaginative ideas
- Ask questions

Together we can be mathematicians

Leone Burton, quoted in School Mathematics as a Special Kind of Mathematics: Watson (2008)

National Curriculum - Aims

Purpose of study (page 3)

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is **essential** to everyday life, critical to science, technology and engineering, and **necessary** for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, **an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.**

***emphases added**

National Curriculum - Aims

Aims (page 3)

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

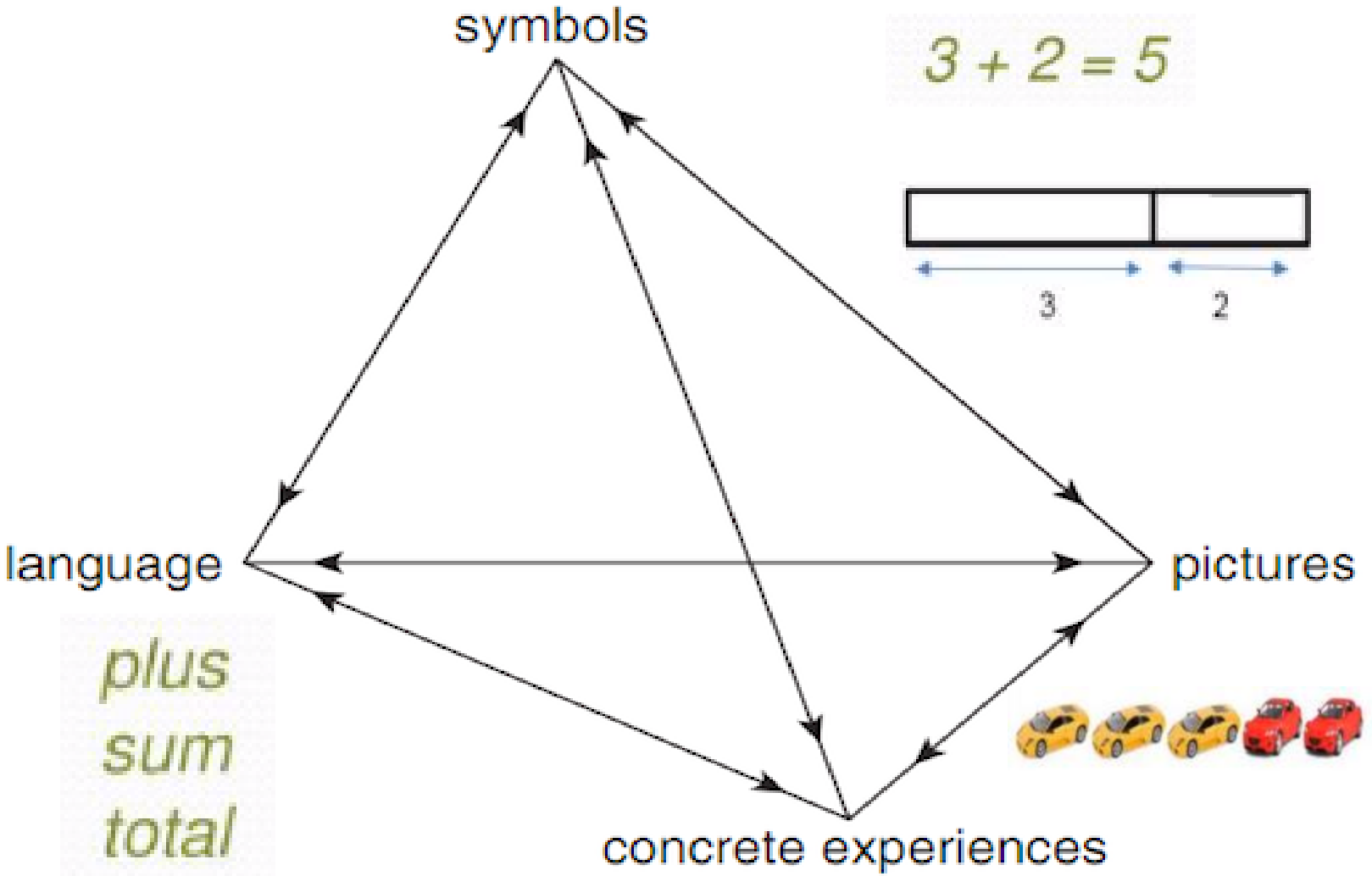
What does it mean to master something?

- I know how to do it
- It becomes automatic and I don't need to think about it- for example driving a car
- I'm really good at doing it – painting a room, or a picture
- I can show someone else how to do it

A pupil really understands a mathematical concept, idea or technique if he or she can:

- describe it in his or her own words;
- represent it in a variety of ways (e.g. using concrete materials, pictures and symbols – the CPA approach)
- explain it to someone else
- make up his or her own examples (and non-examples) of it
- see connections between it and other facts or ideas
- recognise it in new situations and contexts
- make use of it in various ways, including in new situations

Making Connections

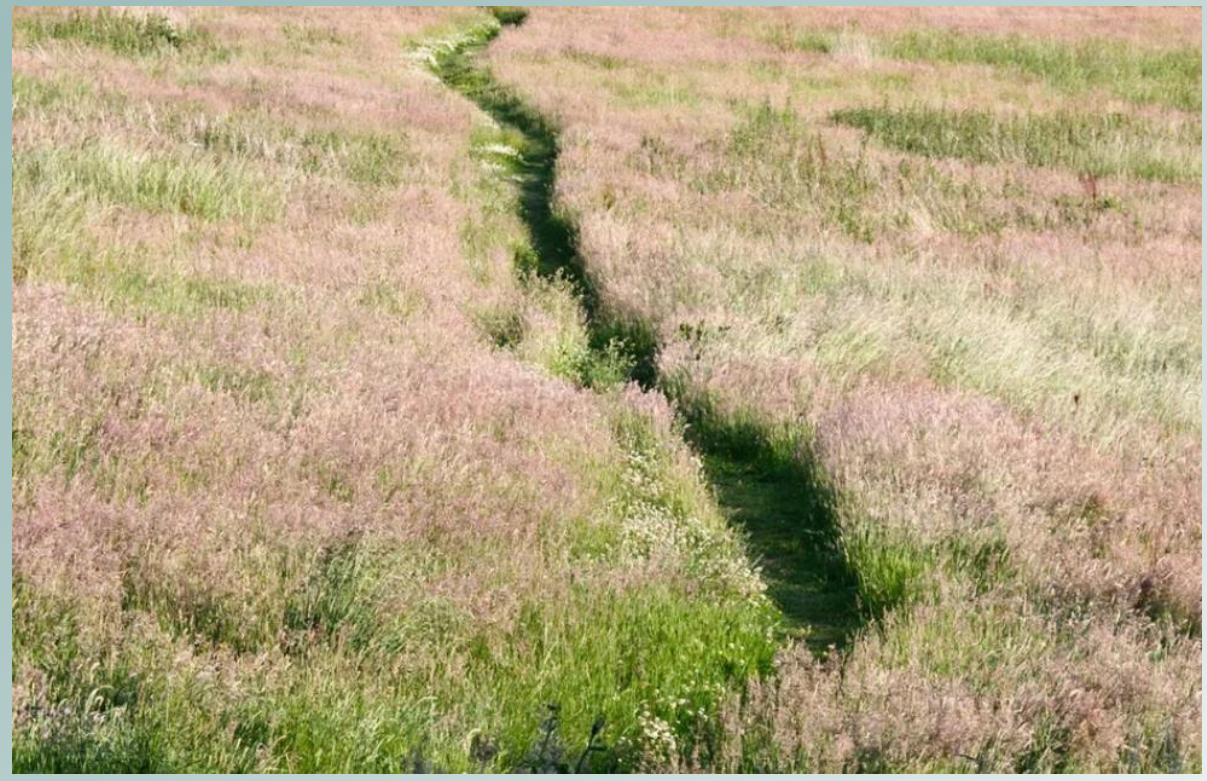


Understanding Mathematics in the Lower Primary Years – Haylock & Cockburn (2003)

The importance of mathematical talk

- Use of talk partners, rehearsal, confidence – tell yourself, tell your partner, tell the class, write it down
- Making connections
- Spotting patterns
- Creating generalisations – a mathematical rule or pattern that is always true
- Thinking mathematically - reasoning

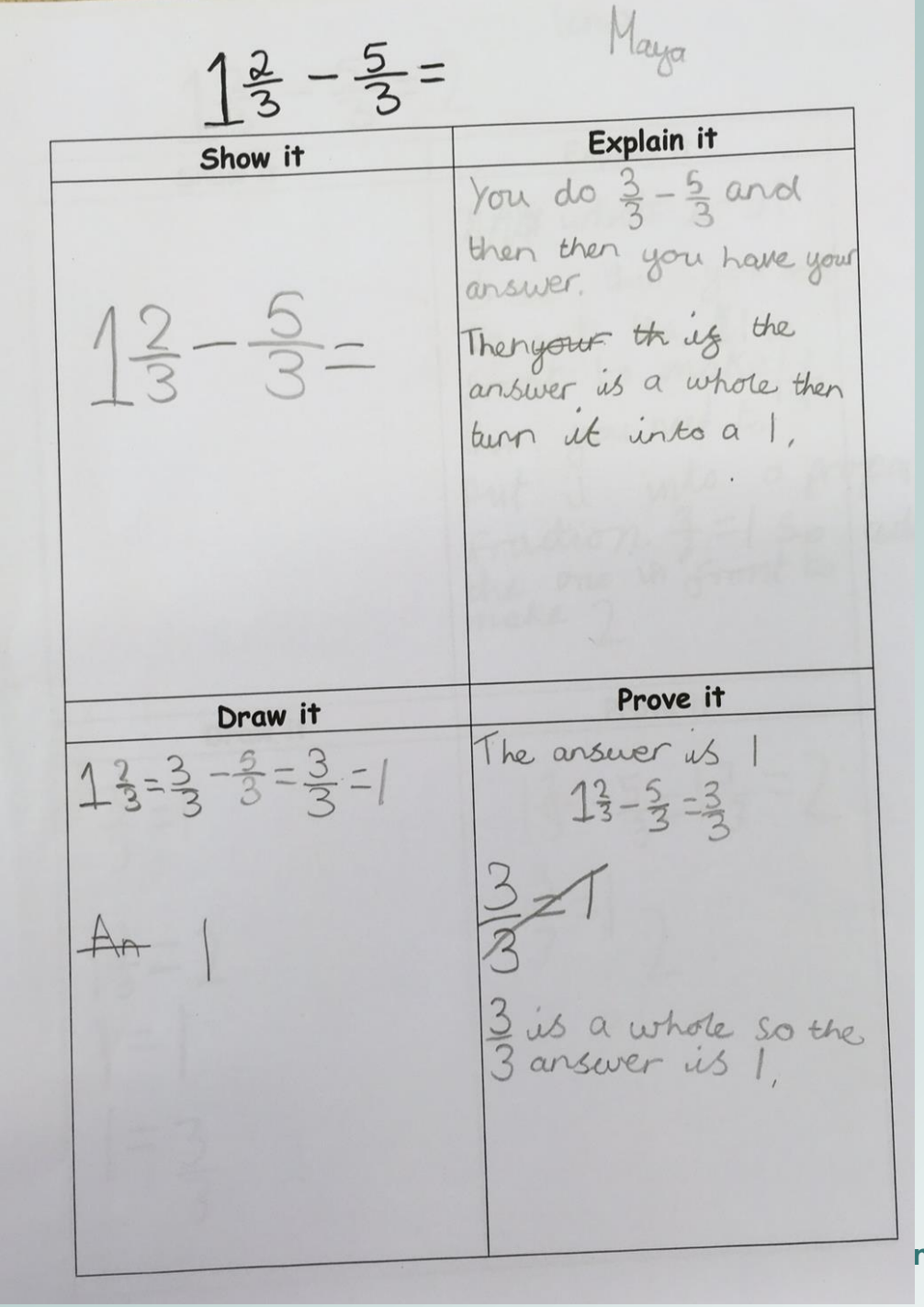
Spoken before written



I think…

because…

The answer is only the beginning



MATHSHUBS
MÖBIUS

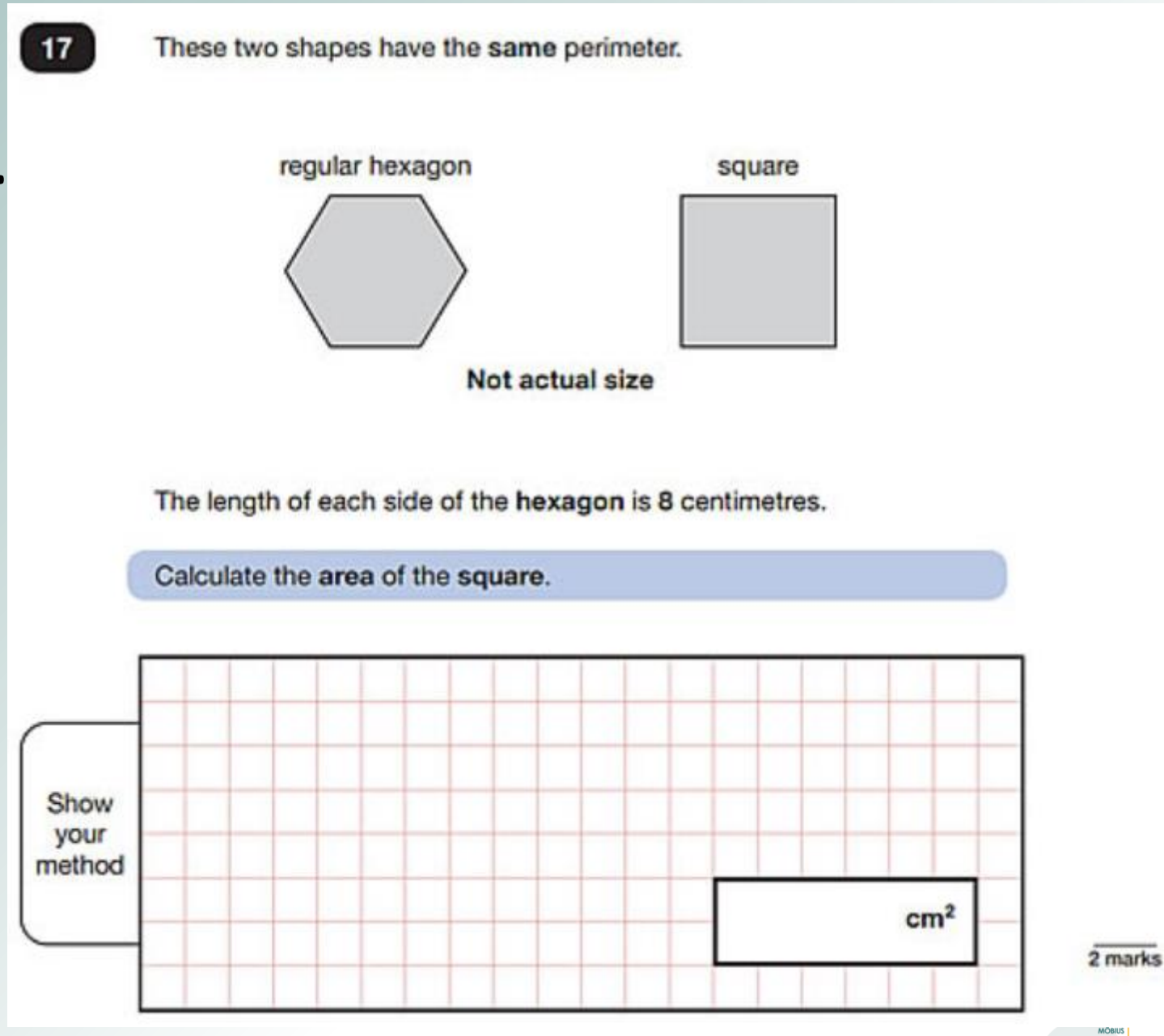
- It's not just about knowing the answer!
- Challenge isn't about working with bigger numbers
- 4 ways is a good day!

mail: info@mobiusmathshub.org.uk

NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

By the end of year 6…

- To succeed in year 6 SATs, pupils need to be able to
  - apply knowledge in unfamiliar ways
  - think flexibly
  - be resilient
  - be able to explain their thinking.



17 These two shapes have the **same** perimeter.

regular hexagon

square

Not actual size

The length of each side of the **hexagon** is 8 centimetres.

Calculate the **area** of the **square**.

Show your method

cm^2

2 marks

Top tips for parents!

Be positive about maths. Try not to say things like "I can't do maths" or "I hated maths at school" - your child may start to think like that themselves.

Point out the maths in everyday life. Include your child in activities involving numbers and measuring, such as shopping, cooking and travelling.

Praise your child for effort rather than for being "clever". This shows them that by working hard they can always improve.