

Hemingford Grey Primary School
Maths Evening

Wednesday 21st November 7pm

Mathematical Mindset

Having a Growth Mindset:

Believe that talents, skills and abilities can be developed

View mistakes as an opportunity to learn

Recognise the rewards of hard work involves showing resilience when faced with a challenge

Fixed mindsets can be common in mathematics, with many parents confessing “I’m really not a maths person,” or “I can’t do maths”. This in turn can influence children’s views of the subject and views of themselves leading to a detrimental effect on maths achievement.

Therefore, we need to be aware of the words we use when talking to children about their progress and achievement in maths that we are encouraging a positive mindset.

Instead of saying...

I can't do this!

Try to say...

I can't do this yet,
so I need to...

Instead of saying...

I'm not good at
this.

Try to say...

I can get better at
this by...

Instead of saying...

I didn't do very
well.

Try to say...

What can I do to
get even better?

Instead of saying...

I'm really good at
this.

Try to say...

I did well at this
because...

Learning from mistakes

Mistakes are good, if they are handled in the right way.

When a child makes a mistake in maths:

Establish if your child has noticed and understood the mistake.

Ask your child to explain how they think the mistake happened.

Try to give strategies for recognising mistakes

- for example, if I am adding two odd numbers, I will know
I've made a mistake if my answer is odd.

Give your child a chance to try again and recognise their progress.

(Metacognition (noun): awareness and understanding of one's own thought processes)

Meta-cognition

Thinking about our thinking is really useful for helping us to improve. But that doesn't mean knowing what you're good at and doing more of it; it's about knowing what you're not so good at and knowing how to get even better.

It helps me to draw diagrams and pictures to unlock a problem

Sometimes I spend too much time on a problem, but I am getting better at going on to the next one and coming back to it later.

When I get stuck I try to think about the last point where I understood and go back to that point.

I find fraction hard but I've realised that it's because I don't know my times tables and division facts so I must practise them.

Mathematical Learning

Fluency

Knowing key mathematical facts and recalling them efficiently.

Problem Solving

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

Reasoning

Encouraging children to justify, explain and discuss their thinking.

These skills play an essential role in helping pupils to gain a deeper understanding of a concept.

Mathematical Concepts

Fractions

Statistics

Measure

Position and Direction

Number &

Place Value

Geometry

Four operations

Our core approach:

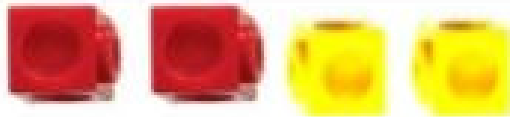
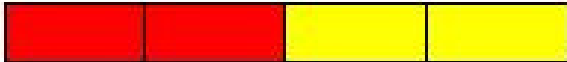
We want to arm children with a variety of strategies to tackle problems logically and independently, using what they already know.

- Small stepped learning
- Concrete, pictorial and abstract representations
- Challenge within age related expectations
- A varied diet of questions
- Children can use efficient mental strategies

This ensures that children have a thorough and deeper understanding.

Concrete manipulatives and pictorial representations help children embed their understanding and also helps them to explain the maths.

Concrete, Pictorial, Abstract

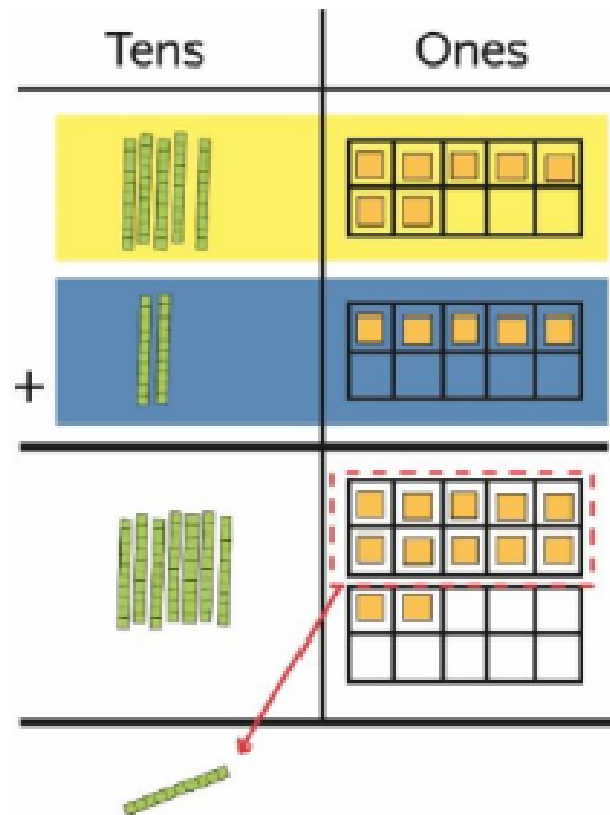
Concrete	Pictorial	Abstract
		$\frac{1}{2}$

Maths in Foundation Stage

Key Stage 1 :

Adding using dienes:

To To



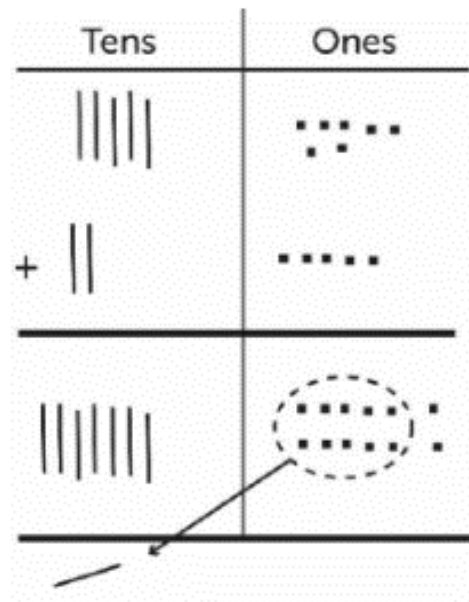
$$57+25$$

Using concrete resources

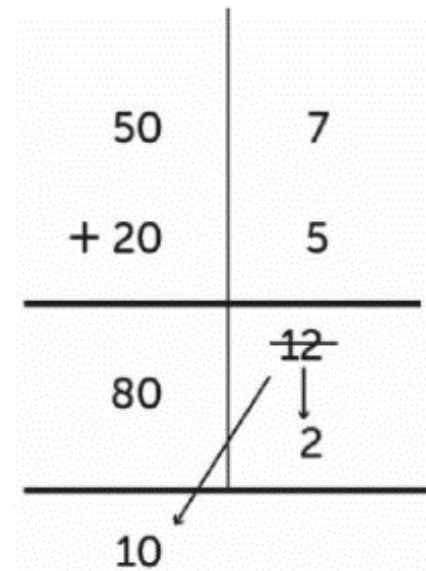
Now try:
 $48+35$

Using pictorial representations

57+25



Abstract



Key Stage 2 :

Concrete resources can also help to challenge children:

Show me the difference between 5.2 and 6.1 on a beadstring.

Using a beadstring convince me that the difference between -1 and 2 is 3.

The beadstring shows numbers from 305,000 to 306,000. What is the value each individual bead represents?

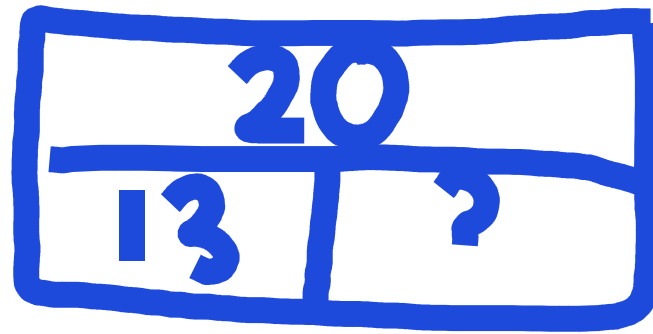
Pictorial: The bar model

Bar models are rectangular bars drawn to represent a scenario posed in a worded problem. These rectangles provide a way to "see" the steps and the appropriate operations needed to solve the problem.

They model the worded problem in its most simplistic state, removing all words except for the key information. This allows children to deal with one section of the problem at a time and gives space to decide whether the piece of information is important in the context.

Year 2 example

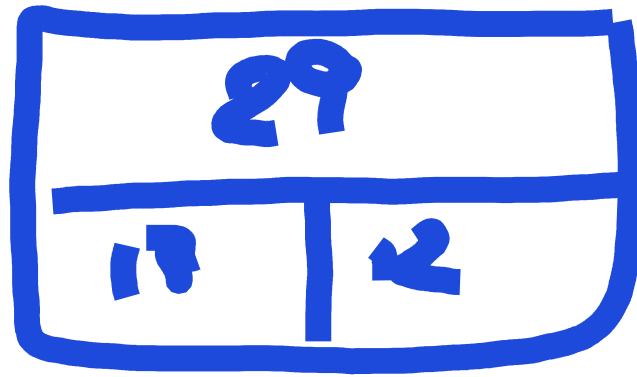
Jo's book has a space for 20 dragon cards. He has 13 cards. How many more does he need to fill the book?



$$20 - 13 = 7$$

Year 2 example

Ann has 17 beads. Haley has 12 beads. How many do they have altogether?



Now try:

Year 6 example

Sarah saves $\frac{2}{3}$ of her pocket money every week.
After 4 weeks, she has saved £32.

How much pocket money does Sarah get per week?

Now try:

Ben ran $\frac{3}{4}$ of a race in 15 minutes. He carried on at the same pace for the rest of the race.
How long did it take him to complete the race?

Efficient Mental Strategies

How would you solve this?

$$86 \times 2.5$$

Which are the **most** efficient?

Choosing an efficient strategy

Halving/Doubling

$$24 \times 6$$

$$1.5 \times$$

$$8$$

Equal sum

$$997 + 12,789$$

Place value digit position

$$0.008 + 1.2$$

$$3$$

$$0.3 \times 10$$

$$12.56 -$$

$$0.03$$

The zero effect

$$345 \times$$

$$0$$

Place value
Known fact

$$70 \times$$

$$8$$

Equal difference

$$234,678 -$$

$$19,998$$

The one effect

$$345 \times$$

$$1$$

Times Table Facts

I know $3 \times 7 = 21$

What else do I know?

Fluency

Which is greater? Seventy six thousand, eight hundred and twenty six or 78,626.

Order these numbers from smallest to largest 3,620,566, 366,216, 3,267,958, 3,410,058, 3,267,589, 3,654,233

Here are 7 digit cards. Make as many 7 digit numbers as you can and order them from largest to smallest.
5057613

Reasoning

Put a number in the missing space below to make the sentence correct. $4_236460 > 46236460$
Is there another option? Explain how you it is correct.

Show the value of the digit 6 in these numbers?
6,787,555 9,546,754
Explain how you know.

Problem solving

Do, then explain
Find out the populations in five countries. Order the populations starting with the largest. Explain how you ordered the countries and their populations.

Miss Jones, the teacher has four cards. On each card is a number:

42,350

43,685

56,995

56,943

She gives one card to each pupil. They each look at them and say a clue. Alfie says, 'My number is 57,000 when rounded to the nearest 10'. Ben says 'My number has exactly 3 hundreds in it.'. Caleb says 'My number is 44,000 when rounded to the nearest thousand.'. Patrick says 'My number is exactly 100 less than 57,043'. Solve who had which card and explain how you know.

Claire is given the calculation below to estimate an answer to

$1,912 + 1,888 =$

Claire says 'I will just double 1,900 which is 3,800'. Why has Claire done that? Would you do anything differently?

Fluency

Continue the sequence:

2, 4, 6, 8, 10, __, __, __

15, 20, 25, 30, __, __

90, 80, 70, __, __, __

21, 18, 15, __, __, __

Fill in the missing numbers

10, 20, 25, 30, __, 40

Circle the odd one out:

20, 18, 17, 14, 12, 10

3, 8, 13, 18, 23, 27, 33,

12, 15, 18, 20, 24

Reasoning

Spot the mistake:

What is wrong with this sequence of numbers?

55, 50, 45, 35

True or False

I start at 0 and count in 3?s. I say the number 14.

What comes next?

$21 + 5 = 26$

$26 + 5 = 31$

$31 + 5 = 36$

Explain how you know.

Problem solving

Harry has made a sequence of numbers using six number cards. Here are three of the cards: can you think of two sequences Harry could have made?

10, 20, 30

A spider is climbing a 30m building. Each day it climbs 5m and slides back down 1m. How many days will it take to reach the top?

Sid is counting in 2?s, Luke is counting in 3?s. Sid says ?If we add our numbers together as we count we can make a new pattern.? What pattern do they make? What happens if Sid counts in 5?s and Luke counts in 10?s?

Questions to ask your child:

How do you know?

Can you prove it?

Can you come up with a different method?

Represent the problem pictorially.

What do you notice?

Will it always do that, and why?

What happens if...?

Does your answer seem reasonable? Why/why not?

As parents or carers by building confidence, resilience and a passion for maths in your child, whatever prior experience or preconceptions you may have maths can be something that your child enjoys, values and can master!