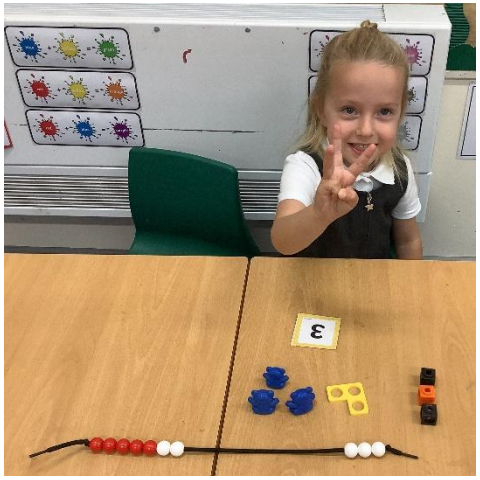


MATHS AT SOUTH HILL

PARENT WORKSHOP

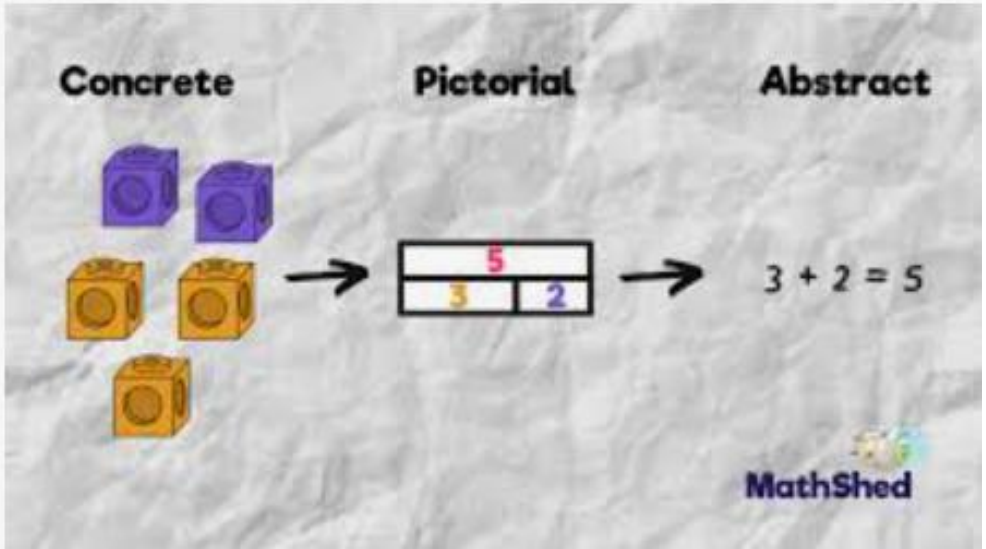
Welcome

- Aim of this morning: 'Mistakes Help Us Learn!'
- We will be explaining common misconceptions that children face in maths and demonstrate how the CPA (Concrete, Pictorial, Abstract) approach supports deeper understanding.
- Mistakes are not obstacles but are valuable learning opportunities.
- 'Mistakes are proof that you are trying'

Concrete, Pictorial and Abstract (CPA)

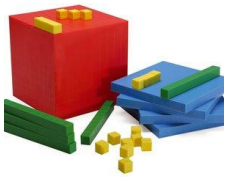
Each of the teaching sequences here at South Hill focus on a three-tiered process of learning.

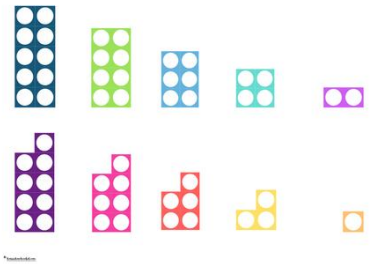
- Concrete – The initial phase of any new learning is centred around the use of objects and manipulatives.
- Pictorial – Secondly, children begin to show representations of numbers and problems through pictures and diagrams.
- Abstract – Also known as the 'symbolic' phase, the abstract process is a more formal, written representation of a calculation.



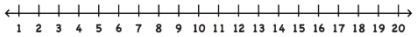
Resources your child will use at school (Concrete phase)

- Base ten
- Numicon/tens frames
- Bead strings
- Number lines
- Multi link
- Counting bears
- Hundred square
- Cuisenaire





1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Why use these approaches?

- The CPA approach brings Maths to 'life' by allowing children to experience and handle objects/concrete materials before moving on to traditional written methods. Throughout learning, children will go back and forth through the CPA stages to reinforce understanding.

What are misconceptions?

- Misconceptions are ideas that seem right but are not. They are a normal part of learning.

e.g

- 30 + 6 = 306
- This tells us our place value isn't quite secure yet. We need more practice using base 10.
- We can use base 10 to help us prove the answer.

Misconceptions

- Mistakes help us learn.
- We're not afraid of mistakes in maths – we celebrate them.
- Mistakes are proof that you are trying.
- Children love telling us when we are incorrect and enjoy proving us wrong.
- Today, we are unpacking misconceptions and showing how we use CPA to help children overcome them!

The importance of vocabulary

addition
approximate
calculate
calculation
common multiple
consecutive
decimal number
decimal place
decrease
difference
digit
ones
tens
hundreds
regroup
equal to
division
divisor
fraction
halve
inverse
< (less than)
method
minus
> (more than)
multiple
multiplication
numeral
subtraction
subtract
take away
less

- _____ ones/tens/hundreds subtract _____ ones/tens/hundreds is equal to _____
- I can/cannot subtract _____ ones/tens/hundreds from _____ ones/tens/hundreds, so I do/do not need to make a regroup.

Each step of learning is supported by a speaking frame. Here we have an example of how to explain multiplication within groups.

Here we have included some of the key words of the KS2 curriculum of terms children should be confident in using across the topics. ***This is 1/12 of the list!***

The importance of vocabulary

We encourage children to talk through their thinking to deepen understanding and reasoning skills:

- I think it should be…
- It can't be …
- Let me prove it with …
- It could be … because …
- I know last time I … so …

To overcome our worries around maths we can start with the answer and ask - what could the question be? The answer is 100. What is the question?

Ask open-ended questions:

- How do you know?
- Can you show me another way?
- What mistake might someone make here?

Misconceptions in the Early Years

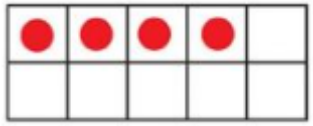
- In Reception we teach Maths 4 times a week, however mathematical learning opportunities are available across the indoor and outdoor provision, which children can access every day.
- We build strong foundations of mathematical understanding and work towards children achieving the Early Learning Goals by the end of the year.
- Children will explore mathematical concepts through stories, songs and rhymes, concrete resources and games.
- In EYFS they ensure that children use ‘careful counting’. They ensure children know the last number we say is the total.
- Often teachers will make mistakes on purpose because our children love to correct us. We make these to help our children learn from our mistakes.

Careful counting in EYFS/KS1…

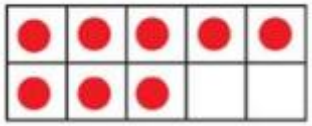
Common misconceptions we can help to learn from are :

Counting carefully

'Cardinality' – knowing the last number we count is how many we have in a set



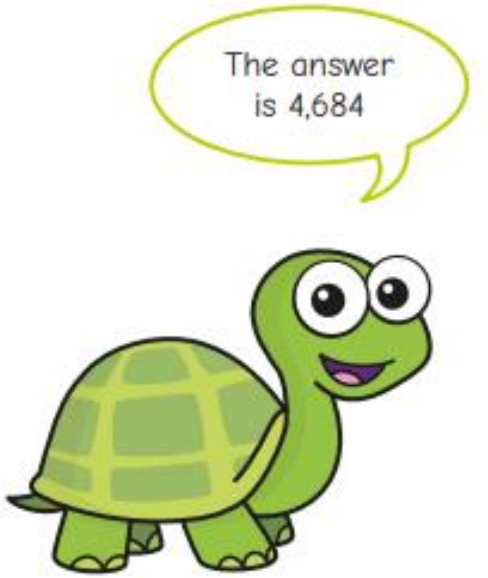
Subitising – knowing how many without counting



These skills build the foundations to number fluency.

Addition CPA and misconceptions

Tiny works out 1,234 + 345



What mistake has Tiny made?

What is the correct answer?

Common misconceptions we can help to learn from are …

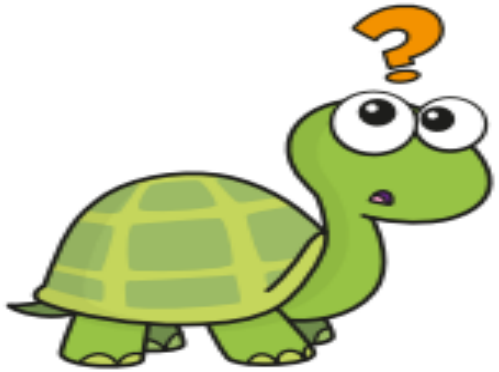
- Errors in regrouping when adding
- Misplacing digits in column method (place value errors)
- Decimal point confusion

$$\begin{array}{r} 68.4 \\ +\ 3.25 \\ \hline \end{array}$$

Subtraction CPA and misconceptions

Tiny has worked out 3,035 – 1,074

		Th	H	T	O	
		$^{2}\not{3}$	0	$^{1}3$	5	
	–	1	0	7	4	
		1	0	6	1	



Do you agree with Tiny?

Explain your answer.

Common misconceptions we can help to learn from are …

- Errors in regrouping when subtracting

- Order of numbers in questions

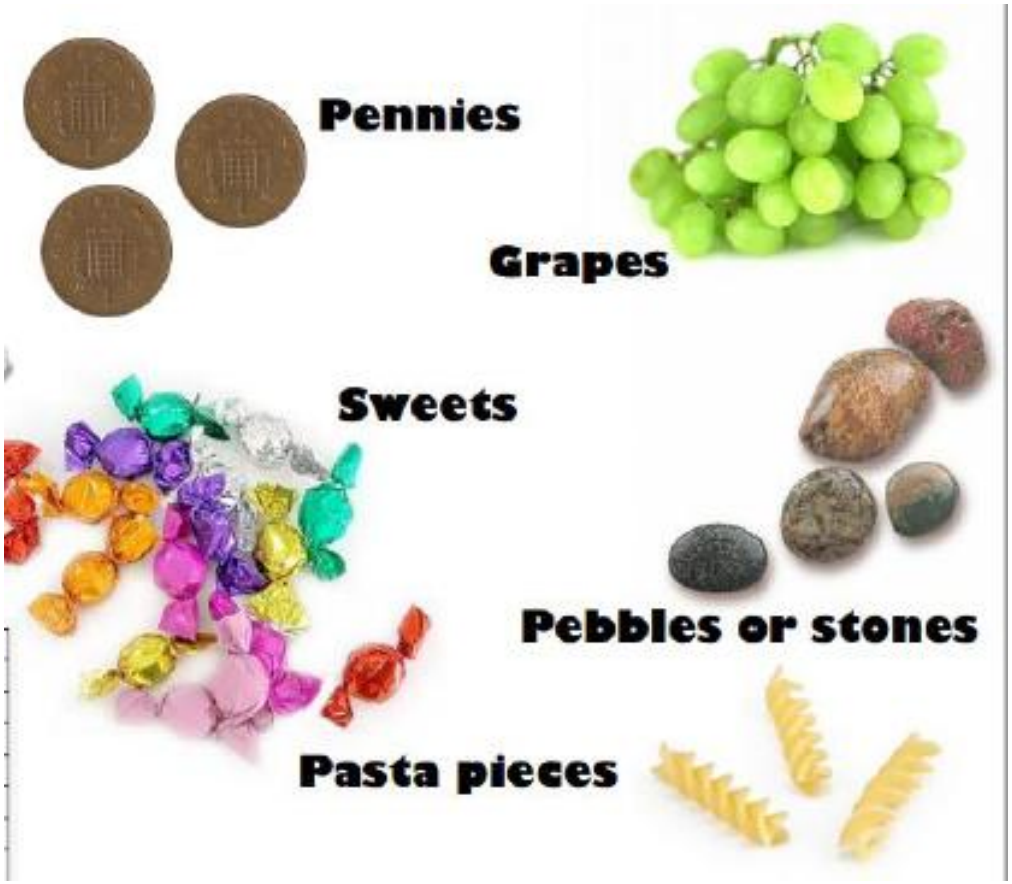
8 – 3 = 5 and not 3 – 8 = 5

- Column method mistakes…

  5823
- 2337
  3514

What has happened here?
Using concrete materials will help us prove then answer.

Resources you could use at home to help with addition and subtraction



Maths at home - handout

Have fun with maths

Play games that involve numbers, such as bingo, dice, card games and board games. Play ‘Guess My Shape’ – you think of a shape, and your child asks you questions in order to guess the shape. You can only answer ‘yes’ or ‘no’. Whatever your age, songs can be an enjoyable way of practising number skills. Try a backwards counting song like ’10 in a Bed’.

Read together

Reading a book together is a great chance for your child to talk about the maths they can see on the page when reading. As well as this, lots of traditional tales and rhymes lend themselves to activities beyond the book. You could use modelling dough to make currant buns as in 'Five Currant Buns in the Baker's Shop', or make models of the animals used to pull Cinderella's coach and put them in order by size. Use building blocks to build a house for the little pigs and focus on the use of first, second, third etc. Or you could make a tower for Rapunzel and talk about how many bricks and which colour(s) you used.

Talk about maths

Talking with your child about maths is important for building confidence. Whenever you can, try to talk about how you use maths in everyday life. Talking about recipes is a great way of doing this – you can count and measure ingredients, or, for example, share out banana slices equally between cakes and tomatoes equally between kebab sticks. You can also help your child to follow instructions, understanding first, second, third etc, or you could set a timer and talk about the amount of time needed to complete a recipe.

When you do the washing, separate items of clothing: all the socks in one pile, shirts in another, and trousers in another. Divide the socks by colour and count the number of each. Ask your child to sort their toys into groups, then ask them to tell you how they sorted them.

Practise number skills

As your child’s understanding and knowledge of number develops, ask them to count in 2s, 5s and 10s. Ask them to sort objects, making groups of 3, 4, 5 or 6 things. Then ask them to make '8' in as many ways as they can (e.g. 4 and 4; 5 and 3; 2 and 6). Play matching games with number fridge magnets and objects. Match the fridge magnet to the correct number of things (e.g., the '8' magnet with 8 objects). Ask your child to look at dominoes and find all the ones that have a certain total: 'Find all the dominoes that have 10 dots altogether.' Then ask them to find a domino with more or less than that number of dots.

Maths at home- handout

Measure up

Help your child to practise using a ruler for drawing straight lines and measuring. Make a picture using straight lines. Help your child to hold the ruler carefully as they draw. Play 'How Long?' or 'How wide?'. Work together to measure the length or height of everyday objects in the house (in metres or centimetres). Point out the starting and finishing number on the ruler and read the measurement together. Help your child line the object up with the 0 on the ruler or tape when they measure.

Order objects by height or length and use the words 'longer/taller than', 'shorter than', 'longest/tallest' and 'shortest'. Choose some items from your kitchen cupboard. Weigh them together and put them in order. Use the words 'heavier than', 'lighter than', 'heaviest' and 'lightest'.

Practise times tables

We start with the 2, 5 and 10 times tables and then move to more difficult tables in Key stage 2. You can help your child by showing them real-life examples of a times table. For example, a muffin tin will normally have four rows of three muffin cups each, showing the multiplication 4 × 3. Find opportunities to sing and chant times tables together, for example, in the car or on the walk to school. Play TTRS regularly.

Use maths in everyday life

Build your child's confidence in mathematics by talking about and using maths together. You could measure ingredients for recipes together, using scales to do so. You could look at the clock together: 'If the party is at 5 o'clock we need to leave in half an hour. That'll be half past 4.' You could talk about how much things cost, paying and getting change when you go shopping. If you are making a picnic or snack together, you could talk about how many people are eating and how food items can be shared out equally. Make fruit drinks and talk about how much fruit juice there is compared to water: 'We put in a little bit of juice. Then we topped up with water. We put in about 10 times more water than juice.'

Have fun with fractions

Cake, pizza, or any foods with a regular shape can help children understand what fractions are and how they work. Ask your child questions like, 'If I cut our cake into 8 pieces, what fraction will each piece be?' Foods that people might eat a few of are good for helping your child to understand how to find fractions of amounts: 'We've 12 fish fingers in the packet. There are 4 of us. What fraction of the fish fingers can we each have? How many fish fingers would that be?'

Useful online resources

www.topmarks.co.uk

www.ictgames.co.uk

http://www.bbc.co.uk/bitesize

https://whiterosemaths.com/1-minute-maths#download

(White Rose 1-minute maths app)

https://home.oxfordowl.co.uk/kids-activities/fun-maths-games-and-activities/

www.numbots.com

www.ttrockstars.com

To conclude…

- Mistakes are stepping stones to success.
- “Mistakes help us learn”
- CPA helps build strong flexible understanding.
- Your support to overcome misconceptions at home helps make a huge difference!

Thank you for your attendance.

Please feel free to join your child in their class as they show Maths in action.

If you have any questions, please do not hesitate to ask.