

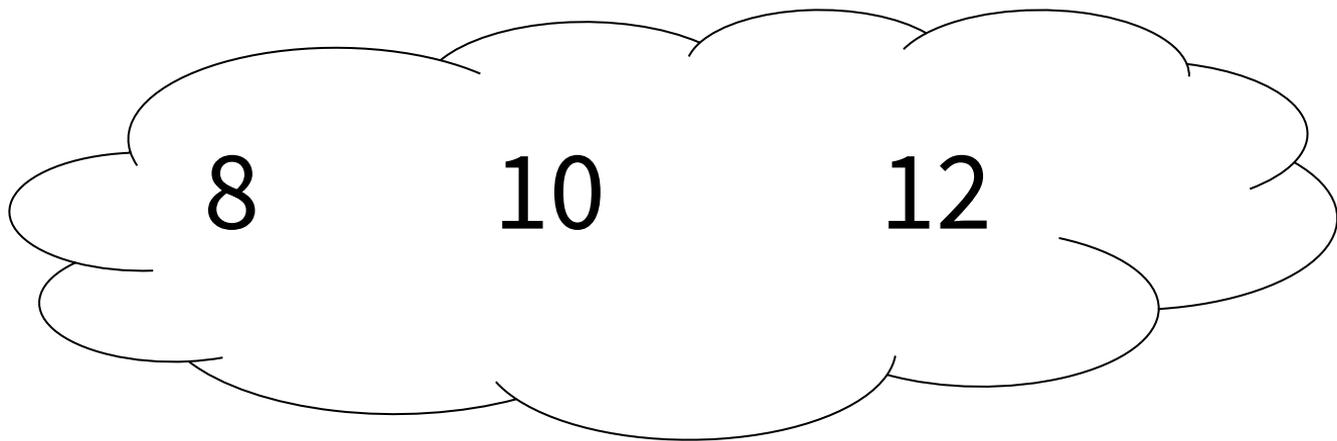
EYFS and KS1 Maths Workshop

Thursday 17th November



Do Now

Which is the odd one out and why?



Digging deeper: Is there another reason? Could you add another number in that satisfies your reasoning?



What positive and negative experiences did you have of maths as a child?

Advice

If children hear 'I can't do maths' or 'I'm rubbish at maths' from parents, teachers, friends they begin to believe it isn't important.

People become less embarrassed about maths skills, as it is acceptable to be 'rubbish at maths'.

We need to change this!

Fixed vs Growth Mindset - Carol Dweck

We believe that **everyone** can get better at maths...when they put in the **effort** and work at it.

Do not praise children for being clever when they succeed at something, but instead praise them for **working hard**.

Children learn to associate **achievement with effort** (which is something they can influence themselves – by working hard), not ‘cleverness’ (a trait perceived as absolute and that they cannot change).



White Rose

White Rose Maths is an award-winning system for teaching and learning mathematics to young learners. It has been developed in accordance with the UK education system by a team of mathematicians who have spent years developing innovative ways to teach mathematics.

It provides detailed "schemes of learning" (a scheme of learning is a clear, time-linked plan for learning) for Early Years up to GCSE level, along with worksheets, interactive whiteboard slides, parent booklets, and various other resources, many of which are free. The lessons are designed to be flexible enough to adapt to any curriculum or timetable.



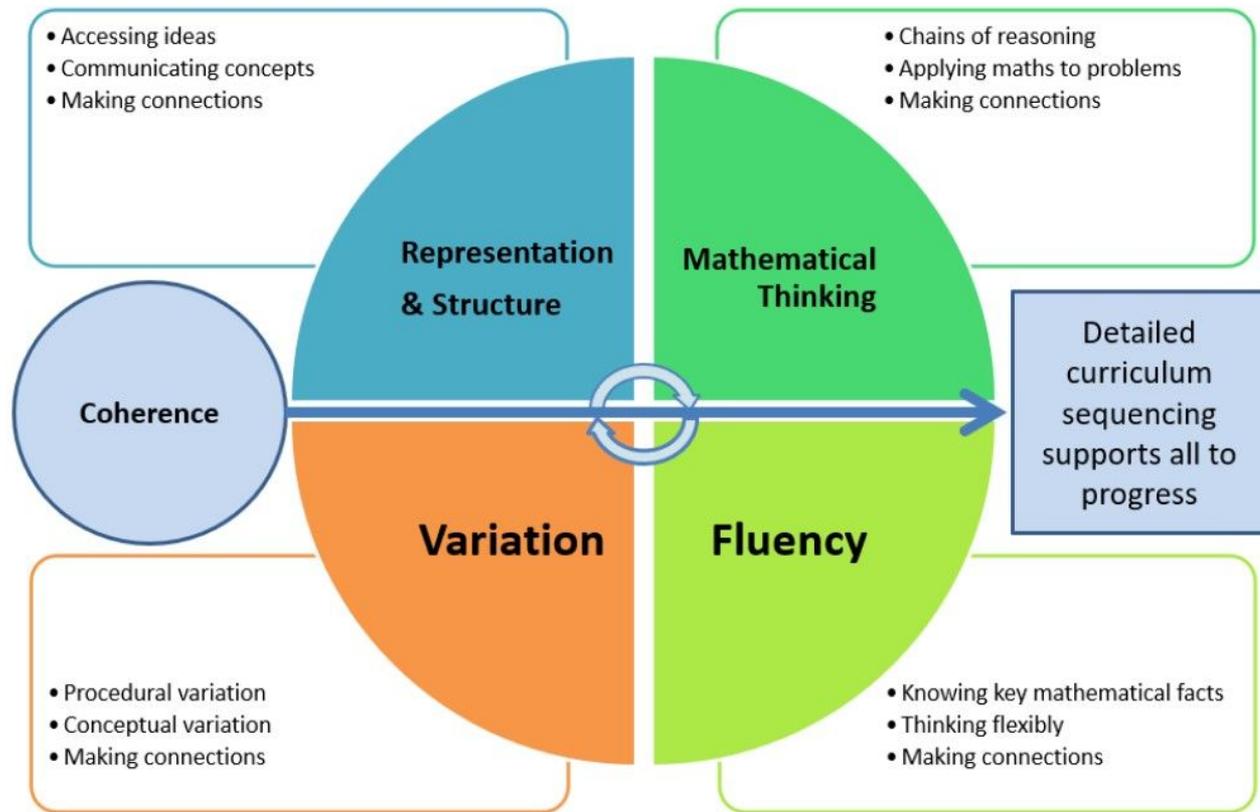
White Rose Aims

Our aim is for young mathematicians to become:

- Confident and able to recall and apply mathematical knowledge in different contexts
- Able to explain their methods and thinking processes and apply skills in context
- Fluent in different areas of maths
- Efficient in applying problem-solving and reasoning skills
- Independent thinkers
- Making number work fun
- Aware of the maths/ concepts/ process they are doing

Teaching for Mastery

To develop our learners into achieving mastery in maths, they need to be proficient in all areas:



Depth

During lessons, children are given opportunities to deepen their understanding of maths and therefore master concepts.

This is achieved by ensuring children are not just expected to answer a question but are given them time to explore it, analyse it and apply the most effective strategy to enable them to solve it with confidence and a deep understanding with the ability to adapt this strategy in the future to new questions and ideas.

When children do this confidently, they have mastered an area of maths and have become confident with their problem-solving approach.

White Rose Calculation Policy

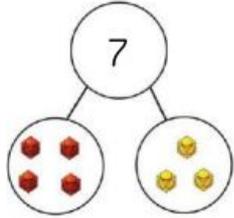
Year 1 - 6

Calculation Policy Addition and Subtraction

#MathsEveryoneCan

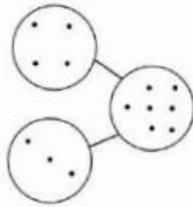


Part-Whole Model



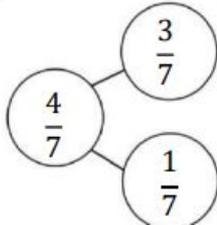
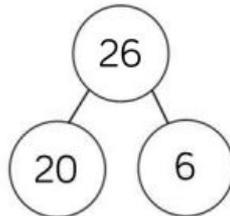
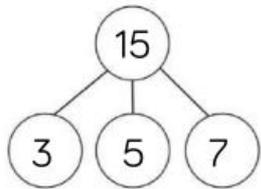
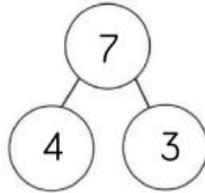
$$7 = 4 + 3$$

$$7 = 3 + 4$$



$$7 - 3 = 4$$

$$7 - 4 = 3$$



Benefits

This part-whole model supports children in their understanding of aggregation and partitioning. Due to its shape, it can be referred to as a cherry part-whole model.

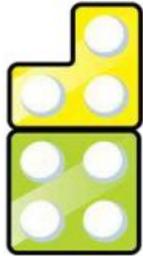
When the parts are complete and the whole is empty, children use aggregation to add the parts together to find the total.

When the whole is complete and at least one of the parts is empty, children use partitioning (a form of subtraction) to find the missing part.

Part-whole models can be used to partition a number into two or more parts, or to help children to partition a number into tens and ones or other place value columns.

In KS2, children can apply their understanding of the part-whole model to add and subtract fractions, decimals and percentages.

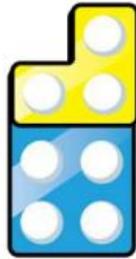
Number Shapes



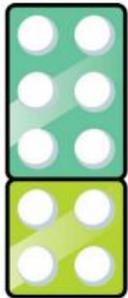
$$7 = 4 + 3$$



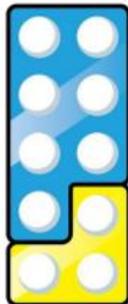
$$7 = 3 + 4$$



$$7 - 3 = 4$$



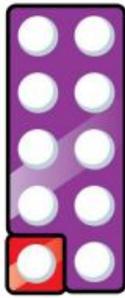
$$6 + 4$$



$$7 + 3$$



$$8 + 2$$



$$9 + 1$$

Benefits

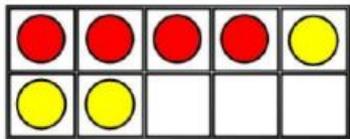
Number shapes can be useful to support children to subitise numbers as well as explore aggregation, partitioning and number bonds.

When adding numbers, children can see how the parts come together making a whole. As children use number shapes more often, they can start to subitise the total due to their familiarity with the shape of each number.

When subtracting numbers, children can start with the whole and then place one of the parts on top of the whole to see what part is missing. Again, children will start to be able to subitise the part that is missing due to their familiarity with the shapes.

Children can also work systematically to find number bonds. As they increase one number by 1, they can see that the other number decreases by 1 to find all the possible number bonds for a number.

Ten Frames (within 10)



$4 + 3 = 7$

$3 + 4 = 7$

$7 - 3 = 4$

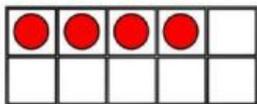
$7 - 4 = 3$

4 is a part.

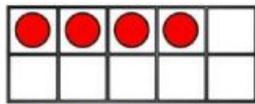
3 is a part.

7 is the whole.

First

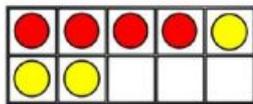


Then

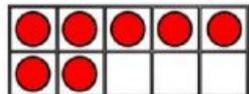


$4 + 3 = 7$

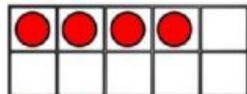
Now



First

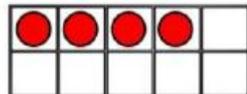


Then



$7 - 3 = 4$

Now



Benefits

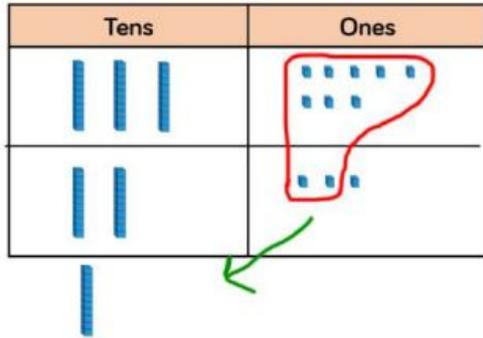
When adding and subtracting within 10, the ten frame can support children to understand the different structures of addition and subtraction.

Using the language of parts and wholes represented by objects on the ten frame introduces children to aggregation and partitioning.

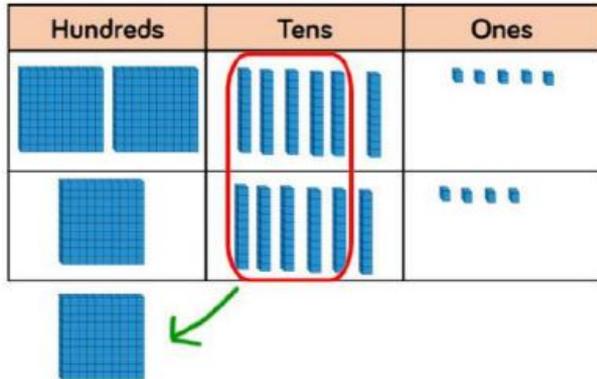
Aggregation is a form of addition where parts are combined together to make a whole. Partitioning is a form of subtraction where the whole is split into parts. Using these structures, the ten frame can enable children to find all the number bonds for a number.

Children can also use ten frames to look at augmentation (increasing a number) and take-away (decreasing a number). This can be introduced through a first, then, now structure which shows the change in the number in the 'then' stage. This can be put into a story structure to help children understand the change e.g. First, there were 7 cars. Then, 3 cars left. Now, there are 4 cars.

Base 10/Dienes (addition)



$$\begin{array}{r} 38 \\ + 23 \\ \hline 61 \\ 1 \end{array}$$



$$\begin{array}{r} 265 \\ + 164 \\ \hline 429 \\ 1 \end{array}$$

Benefits

Using Base 10 or Dienes is an effective way to support children's understanding of column addition. It is important that children write out their calculations alongside using or drawing Base 10 so they can see the clear links between the written method and the model.

Children should first add without an exchange before moving on to addition with exchange. The representation becomes less efficient with larger numbers due to the size of Base 10. In this case, place value counters may be the better model to use.

When adding, always start with the smallest place value column. Here are some questions to support children.

- How many ones are there altogether?
- Can we make an exchange? (Yes or No)
- How many do we exchange? (10 ones for 1 ten, show exchanged 10 in tens column by writing 1 in column)
- How many ones do we have left? (Write in ones column)

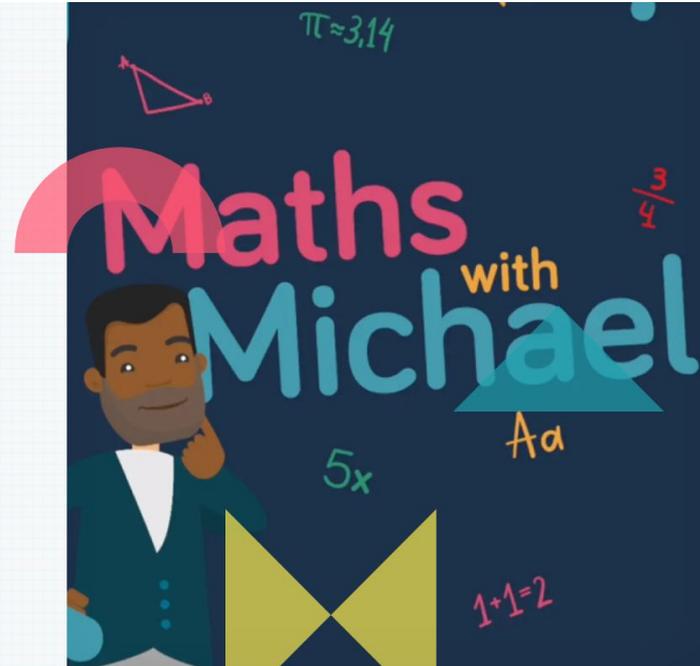
Repeat for each column.

White Rose - Helpful Videos

Maths with Michael

We've teamed up with TV presenter, teacher and parent Michael Underwood to bring you a mini-series called Maths with Michael.

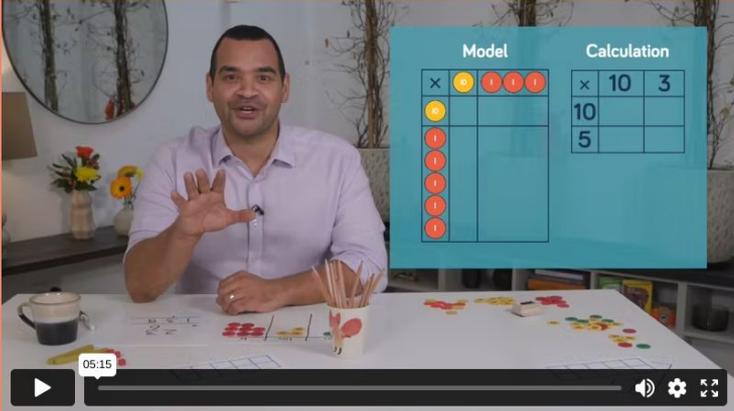
[WATCH THE SERIES](#)



Maths with Michael - parent guides

Each of the six sections has a useful guide with resources that can be printed.

Has maths changed? 1. Place Value 2. Subtraction 3. Multiplication 4. Division 5. Fractions 6. Algebra



The video player shows a man (Michael) sitting at a table with a whiteboard. On the whiteboard, there are two columns: 'Model' and 'Calculation'. The 'Model' column shows a grid with a multiplication sign and a 2x2 grid of colored circles (yellow, red, red, red). The 'Calculation' column shows a grid with a multiplication sign and the numbers 10 and 5 in the first column, and 3 in the second column. The grid is partially filled with numbers: 10, 3, 10, 5.

Model		Calculation	
×	10	×	10 3
10		10	
5		5	

Multiplication

A short 'how to' guide providing information on how you can help your child understand Multiplication..

[GET THE PARENT GUIDE](#)

[← PREV](#) [NEXT →](#)

White Rose - workbooks

On the website there are links to free workbooks that you can use to support your child's learning at home.

[Parent link](#)

Get the free workbooks

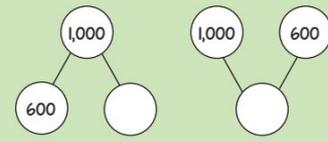
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					
Autumn Block 1 Place value (within 10)	Autumn Block 2 Addition and subtraction (within 10)	Autumn Block 3 Shape	Autumn Block 4 Place value (within 20)	Autumn Block 4 Place value (within 20)	Spring Block 1 Addition and subtraction (within 20)

3 ADDITION AND SUBTRACTION



From White Rose Maths schemes for Year 3 Autumn Term
BLOCK 2 - ADDITION AND SUBTRACTION

1 Complete the part-whole models.



2 Alex has 262 stickers. She buys 12 more.



How many stickers does she have now?

3 Find the missing number.

$$361 = 9 + \square$$

How children learn maths

Concrete representation

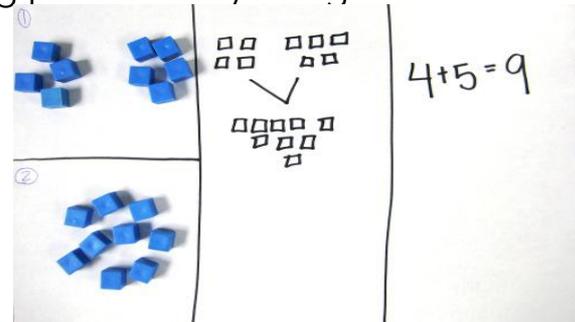
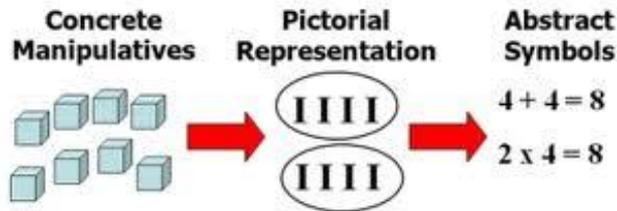
The enactive stage - a child is first introduced to an idea or a skill by acting it out with real objects. In division, for example, this might be done by separating apples into groups of red ones and green ones or by sharing 12 biscuits amongst 6 children. This is a 'hands on' component using real objects and it is the foundation for conceptual understanding.

Pictorial representation

The iconic stage - a child has sufficiently understood the hands-on experiences performed and can now relate them to representations, such as a diagram or picture of the problem. In the case of a division exercise this could be the action of circling objects.

Abstract representation

The symbolic stage - a child is now capable of representing problems by using mathematical notation, for example: $12 \div 2 = 6$



Manipulatives – what are they?

In maths, a **manipulative** is an object which is designed so that a learner can perceive some mathematical concept by manipulating it, hence its name. The use of manipulatives provides a way for children to learn concepts in a developmentally appropriate, hands-on and an experiential way.

Manipulatives



It is extremely important for children to learn to make their own choice about which manipulative will be the most effective for them.

Provide them with several different resources so that they learn that there is not just one way.

Numicon

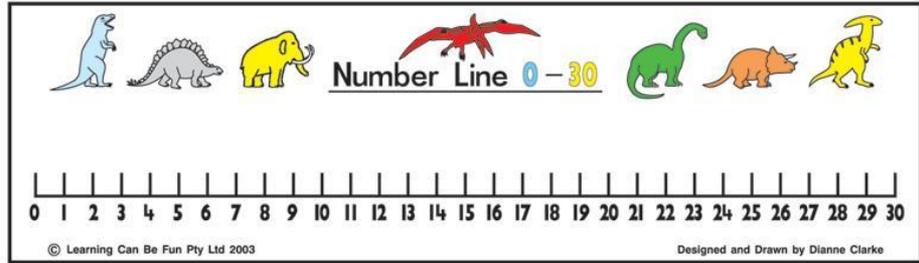


Numicon's imagery uses patterns to represent each numeral.

The patterns are structured so number relationships can be seen and experienced.

Numicon can also be used to teach about fractions, decimals and percentages.

Other counting resources

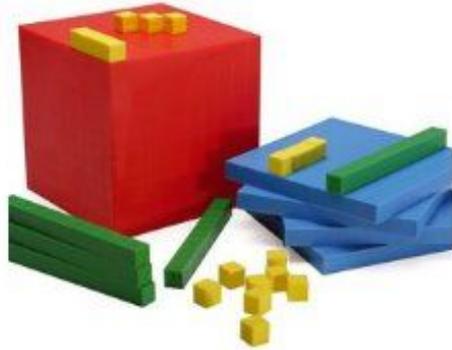


You can explore number bonds to 10 or 100, you can also use bead strings as a visual way of demonstrating fractions, and the four operations.



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

Dienes & place value manipulatives



They are invaluable for helping children to develop an understanding of place value. They are also great for exploring the concept of regrouping in addition and subtraction and can even be used to model the process for long division.

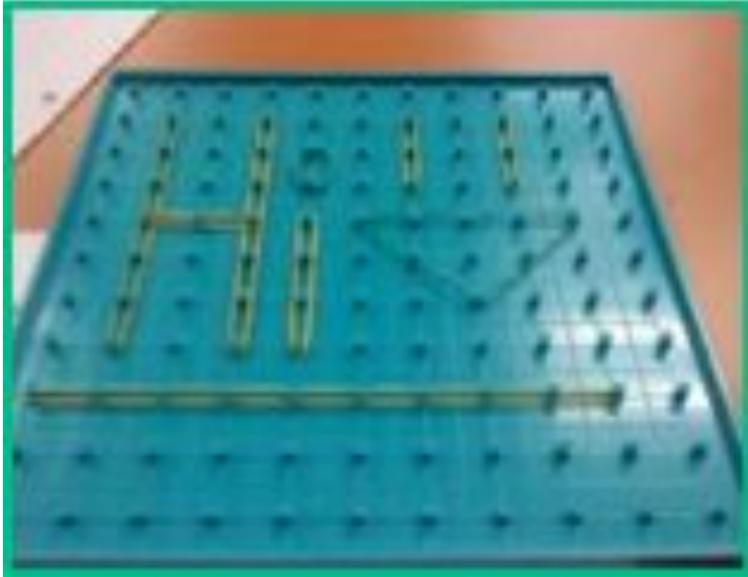


Place value cards are another invaluable resource. Great for reinforcing place value and practising partitioning.



These counters show place value from 'hundredths' to a 'million' and are invaluable for teaching all four operations. They give a concrete representation of the number, especially important when working with larger numbers and decimal numbers.

Geoboards



A great way for exploring geometry. Rubber bands are stretched over the pegs to make different shapes, perfect for exploring sides and vertices, investigating area and perimeter, symmetry, angles and much, much more.

Other manipulatives



Manipulatives at home

Many common household items can be used as manipulatives, such as:

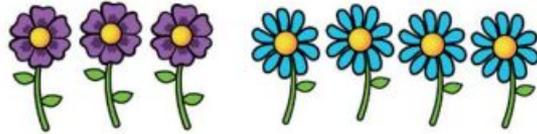
- Counters can be substituted with any small item that you have in large quantities (ie. pebbles, dried beans, wooden blocks). These can be used to count, identify, and compare numbers or provide visual examples of basic addition and subtraction.
- **Coins or play money** can help children learn to count by 5s, 10s, and 25s.
- **Lego blocks** can be used to explain fractions.
- **Dice and cards** can be used to teach addition, subtraction, and for older students, probability.
- **Straws or toothpicks** can be used to create shapes to learn about geometry and calculate the perimeter or area.
- **An egg carton**, with two cups cut off, can make a 2×5 grid. If you use one counter at a time, you can use this grid to show children how to add and subtract numbers up to ten. Alternatively, you can choose a larger number of counters and distribute them evenly among the cups to learn about multiplication and division.

Which manipulative would you choose?

1. What is two more than nine?

2. Tell your partner about the flowers. How many purple flowers can you see? How many blue flowers?

How many flowers altogether?



3. $11 + 43$

Digging deeper: How would this be different if we used a pictorial or abstract approach?

KS1 SATS questions

How can children's exposure to manipulatives help in the assessments they do?

2

$100 - 1 = \boxed{}$

3

$33 + 10 = \boxed{}$

8

$30 + 50 = \boxed{}$

10

$15 \div 5 = \boxed{}$

14

$8 + \boxed{} + 4 = 17$

18

$\frac{1}{4} \text{ of } 16 = \boxed{}$

EYFS end points

- **Subitising** - children being able to recognise how many items there are without needing to count them. Rolling a dice is a good way of practising this.
- **Count** reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number.
- Use quantities and objects to **add and subtract** 2 single-digit numbers and count on or back to find the answer.
- Use everyday **language** to talk about size, weight, capacity, position, distance, time, and money to compare quantities and objects and to solve problems.
- Recognise, create, and describe **patterns**.
- Explore characteristics of everyday objects and shapes and use mathematical **language** to describe them.
- **Relate** to real life

EYFS: What you can do...

You don't need to be an expert to support your child with maths! Here are three simple but effective learning ideas that you can try with your child using everyday items at home.

1. Building with bricks

Building things with bricks is a good way of developing maths skills through solving problems. For example: How many red bricks are there? How many are there altogether? Hmm, I wonder which is the longest brick? Could you pass me the cube over there?

2. Talk about time

Talking about the time at which different things happen and looking at the clock together during the day is a great way to learn about time. This will help set the foundation for telling the time in later years.

3. Count everything!

One of the first number skills your child will learn is counting. Practising counting will help them with all sorts of number problems that they will encounter as they get older. Try to get into the habit of counting when you are out and about. For example: How many buses have we seen? How many bugs are in the garden? How many lamp posts are on the street? How many squirrels have we seen?

EYFS: What you can do...

4. Spot patterns

Look for repeating patterns on curtains, wallpaper, or clothing. Ask your child: Can you see a pattern? Tell me about it. What will come next?

Start patterns with blocks, beads, playing cards, and toys. Encourage your child to build on the pattern to make it longer. You could also look for patterns in time together (for example, seasons, months, or daily routines) and talk about what you notice, or listen for patterns in songs and clap the rhythm.

5. Practise forming numerals

Help your child to learn the numerals by exploring their shapes. You could have fun forming numbers in sand with a stick, or making numbers out of modelling clay. Write numbers for your child to copy, and hold your hand over their hand to help direct them. Try holding their finger and forming the number in the air. Once they can trace out the shape of numerals, see if they can write numbers on their own.

KS1 End Points

- [Year 1](#)
- [Year 2](#)

How you can help Y1:

- **1. Count objects around the house**

When counting, encourage your child to point to each object, putting them in a row. For more than 10 objects, group into tens to see that, for example, 32 is 3 tens and 2 ones. Practise counting in twos, fives or tens using, for example, pairs of socks, fingers on hands or 10p coins.

- **2. Play dice games**

Gather some objects – blocks, buttons, even biscuits! Roll two dice and find the total, using the objects to add practically. Or start with, say, 12 objects, roll a dice and subtract the number shown on the dice to find how many objects are left. The player with more objects wins.

- **3. Use toys**

Explore fractions using some of your child's favourite toys, for example teddies or cars. Ask your child to halve their toys by splitting them into two equal groups. So, for ten cars, make two groups of five. Similarly, practise finding one quarter by splitting toys into four equal groups.

Year 2

1. Partition numbers

Partitioning means to break numbers into parts. Use objects, such as straws grouped in tens, to show numbers split into tens and ones. How many ways can your child find to partition a number?

For example, 54 could be $50 + 4$, $40 + 14$, $30 + 24$, $20 + 34$, or $10 + 44$.

2. Tell stories

Make up addition and subtraction stories together. For example: Two badgers, three hedgehogs and a toad have a picnic. How many animals are there altogether? Four rabbits join in. How many are there now? Two animals go home. How many are left?

3. Play shops

To help your child get used to the value of different coins and notes, use real money to play shops. Price up some toys and take turns to be the customer who pays and the shopkeeper who works out the change.

4. Practise number bonds

5. Counting in 2's, 5's and 10's

Inbetweeenies

Start by asking for a $1/2$ digit number. Place it at the start of the line. Now ask for a higher $1/2$ digit number and place at the end of the line. Now keep asking for numbers in between.



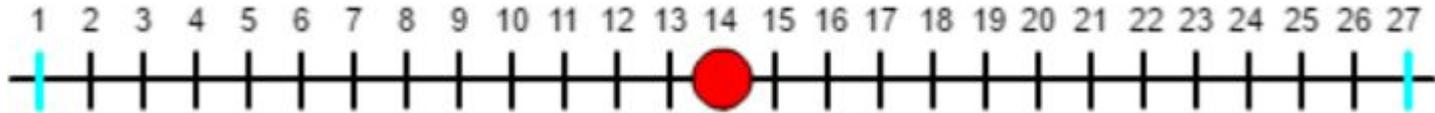
Digging deeper: what is the difference between the two numbers? What is 10 more? 10 less?

Tug of War

One player is minus and the other is plus. Start at 14 on a number line from 1-27.

Plus moves from left to right and minus right to left. Ask the children, why is this?

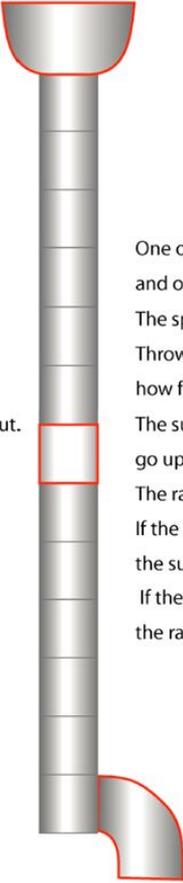
Roll a dice and move that many spaces on the number line. If the counter lands on 1 minus wins, if it lands on 27 plus wins.



Digging deeper: use two dice and add the total before moving.

Alternative

Incey Wincey Spider - a game for two players



Incey Wincey Spider
Climbing up the spout;
Down came the rain
And washed the spider out.
Out came the sunshine
Dried up all the rain;
Incey Wincey Spider
Climbing up again.

One of you is the sunshine
and one of you is the rain.
The spider goes in the middle.
Throw a dice to see
how far the spider goes.
The sunshine makes the spider
go up the drain pipe.
The rain makes it go down.
If the spider gets to the top,
the sunshine wins.
If the spider gets to the bottom,
the rain wins.

Number game: total of 10 (playing cards)

Shuffle the cards and lay out face up into 4 rows of 5 cards.

The aim of the game is to remove all the cards from the table in sets of 2 or more cards which add up to 10. E.g. an 8 and a 2 could be removed and a 3, 5 and 2 could also be removed.

The game can be played individually, with players trying to clear as much of the table as they can.

If played with other players, take it in turns to remove cards. The winner is the person to have removed the most cards by the end of the game.

The game can also be played using number bonds to 20, by finding cards which add up to 20.



Numbots

We would like pupils to be accessing their Numbots accounts on at least a weekly basis.

There are two game modes: story and challenge.

Each level on story mode gets progressively harder. If you find your child becoming frustrated, remember to use our Growth Mindset approach of “You just can’t do it yet!”





This 'dashboard' shows your pupil's avatar on the left (personalised) and the amount of money they have on the right.

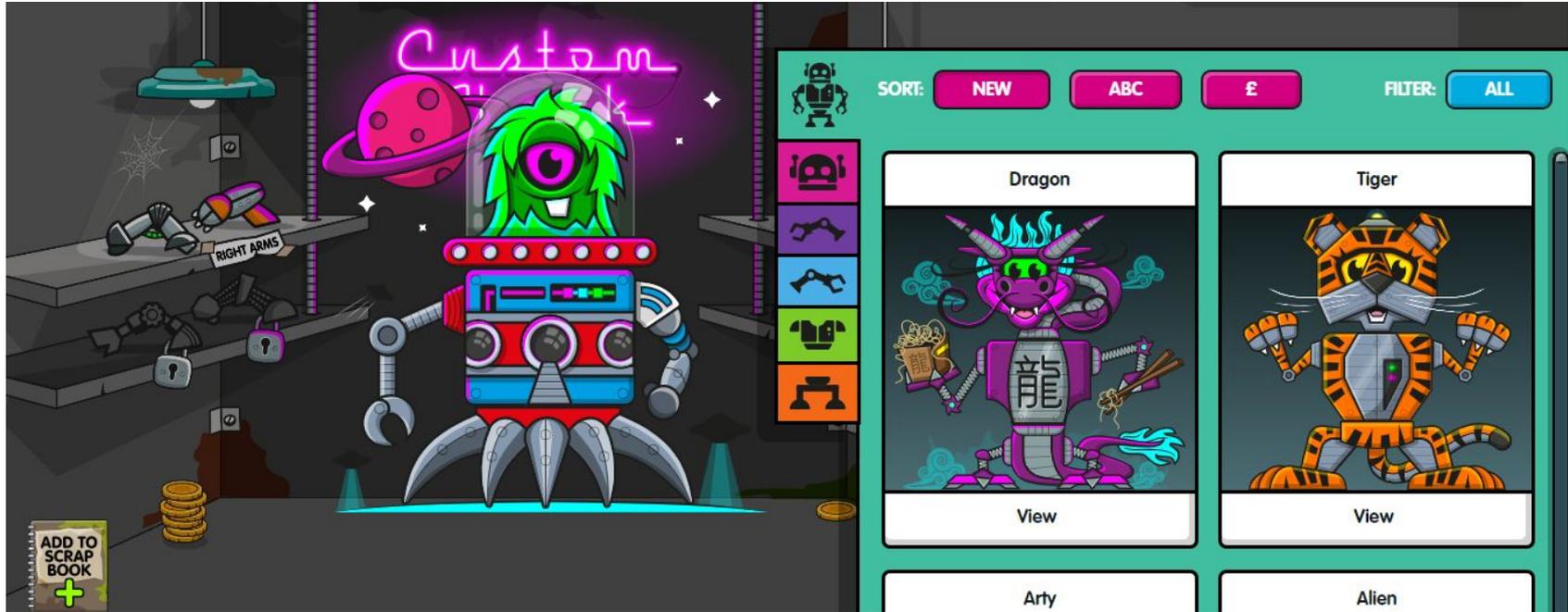
If your child is particularly competitive (aren't we all?!), they can see where they are on the Leaderboard. They can see how they rank amongst their class, year and even school. You can toggle between the last week and 'all time'. You can also toggle between coins and stars. You need 3 stars to 'pass' and complete a level on story mode. Some challenges will earn you more coins than others, depending on your speed and accuracy!

This 'money' can then be spent on...

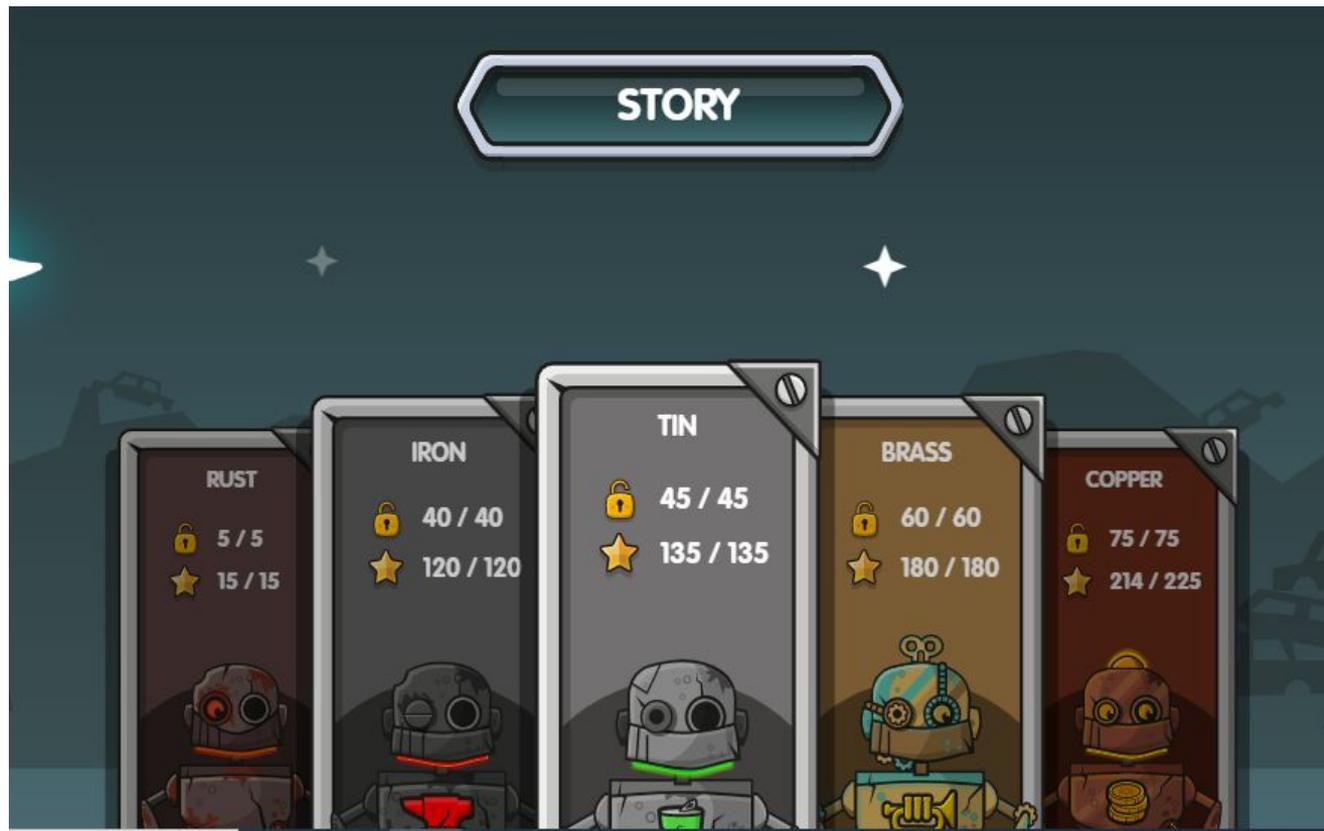




The 'Custom shack'. This is where pupils can change their avatar. They will need coins from challenges to 'purchase' new outfits. They can modify one body part at a time e.g. head/arms/legs. These can be sorted by cost and alphabetically.



They also have the option to add it to their scrap book so they can see all of their previous avatar choices.



Each story has a robot name (based on a robot e.g. Iron Man) and a number of levels and sub-levels. Pupils earn a star per sub-level of which there are 3 for each one. They can move on to the next metal type once they have completed all levels; even if they haven't got 3 stars for each level.

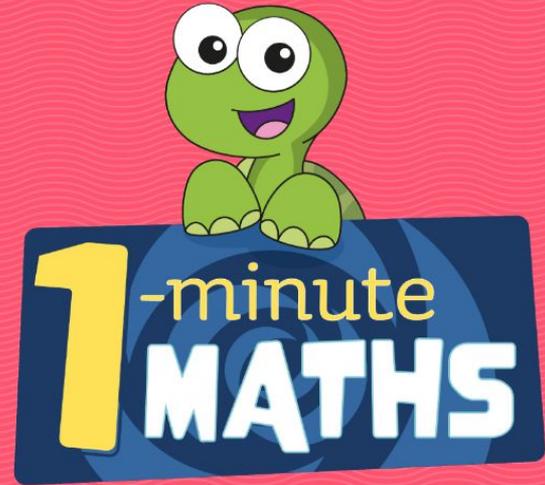
When pupils complete 'Challenges' they can see their score on this dashboard. They earn a trophy (bronze, silver or gold) if they are within the top 3 in their year. We always speak to the children about beating their personal best; not trying to compete with their peers.



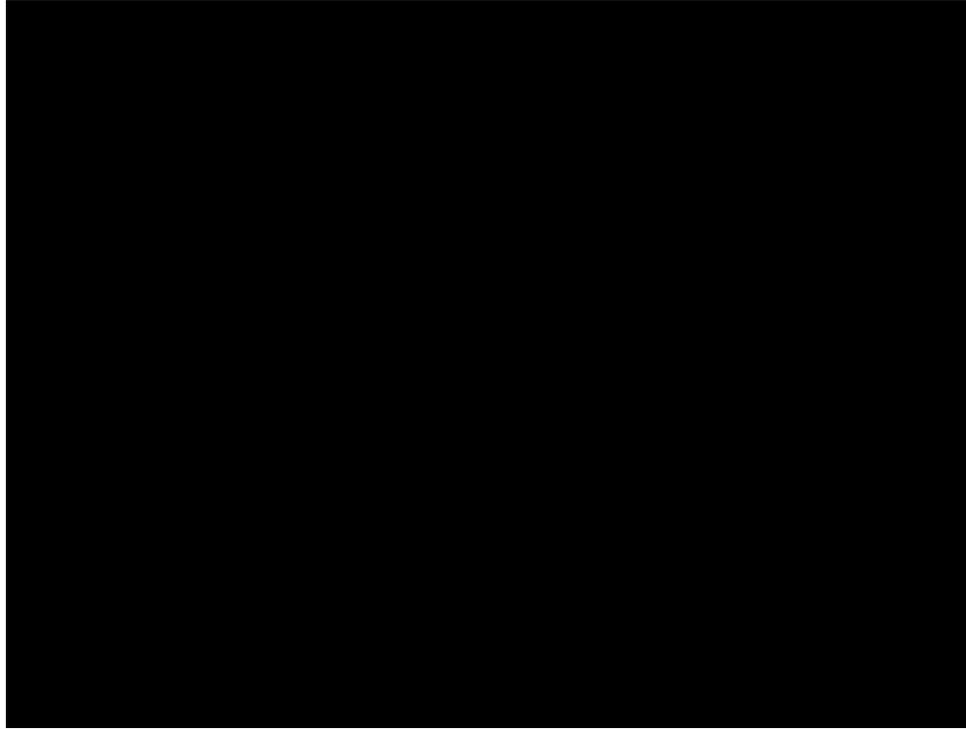
White Rose 1 Minute Maths

Check out these 7 top reasons for using 1-minute maths!

1. Excellent practice — and no distractions.
2. A clear, intuitive process that children pick up straight away.
3. No login or internet access needed. Just download and play.
4. Enjoyable and motivating... How many can they get correct in one minute?
5. Helpful hints match those used in class.
6. Brilliant for building number fluency and confidence.
7. It's **FREE!**



1 Minute Maths



Key Takeaways

- Relate number to real life where possible
- Subitising
- One more, one less
- Number bonds to 10 and 20
- [Numberblocks](#)
- Use homemade manipulatives
- Play (maths) with your child
- Let your child win or be better than you! Otherwise all they learn is that you are better at maths than them
- Recognise that there is more than one way of doing calculations. You may have learned one method, but children are actively encouraged to seek out alternative methods in school and choose one which works for them
- Be an actor! Get excited about maths and your child will get excited too.

Useful Websites

[Third Space Learning](#)

[Manipulatives to use at home](#)

[Calculation policy - addition and subtraction](#)

[Calculation policy - multiplication and division](#)