KS2 Maths Workshop

Thursday 10th November

Do Now

Answer as many as you can in 5 mins

1.

			6	0	7
×				8	3

3. $2\frac{1}{2} - \frac{2}{3} =$

2.

potatoes
£1.50 per kg

carrots
£1.80 per kg

Jack buys $1\frac{1}{2}$ kg of potatoes and $\frac{1}{2}$ kg of carrots.

How much **change** does he get from **£5**?

4. This table shows how many people finished the New York Marathon in each of the first four decades it was held.

New York Marathon	
Decade	**Total number of people who finished**
1st decade	24,863
2nd decade	170,932
3rd decade	282,420
4th decade	350,824

What is the mean number of people who finished the marathon per decade? Round your answer to the **nearest hundred**.

Answers

1. 50,381
2. £1.85
3. 11/6 or 1 whole and ⅚
4. 207,300

How did you find it?

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

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 should 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).

Advice

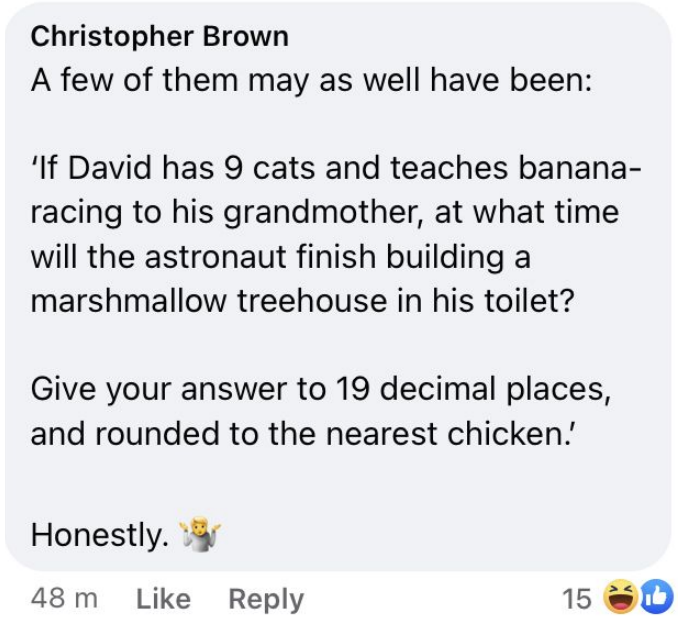
If children hear ‘I can’t do maths’ from parents, teachers, friends they begin to believe it isn’t important.

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

We need to change this!

Review of 2022 SATs

- Notably ‘wordy’ questions
- More reasoning required
- Difficult first questions
- Lots of multi-step problems
- Working harder for single marks
- Didn’t finish completing paper(s)
- Learning gaps in the curriculum
- Less time for revision and preparation
- More interventions required pre-SATs
- High levels of pupil anxiety



KS2 SATS Analysis

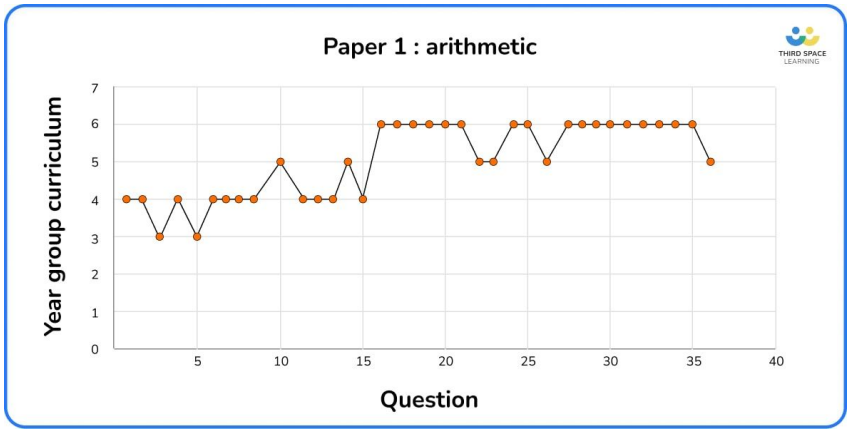
KS2 Maths SATs papers analysis Percentage of questions from each year group curriculum across Arithmetic and Reasoning					
Year	2016	2017	2018	2019	2022
3	16	7	9	10	8
4	17	26	18	21	23
5	27	25	26	21	32
6	43	41	47	47	37

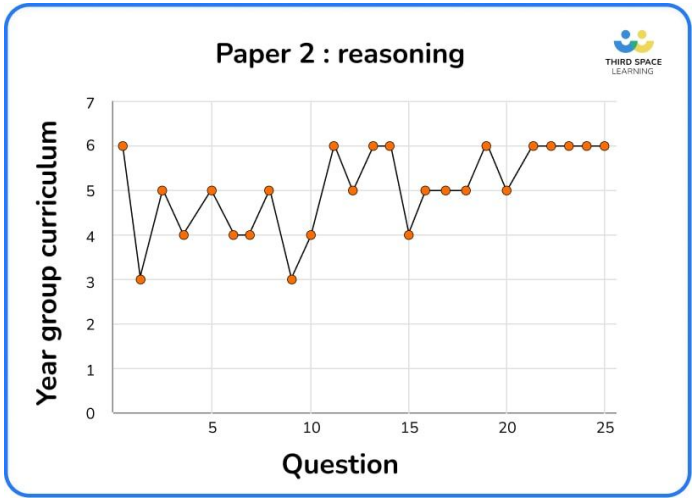
KS2 Maths SATs papers Approximate word counts (rounded to the nearest 100)			
	Paper 2	Paper 3	Total
2016	1100	1200	2300
2017	1200	1300	2500
2018	1200	1300	2500
2019	1200	1300	2500
2022	1300	1100	2400

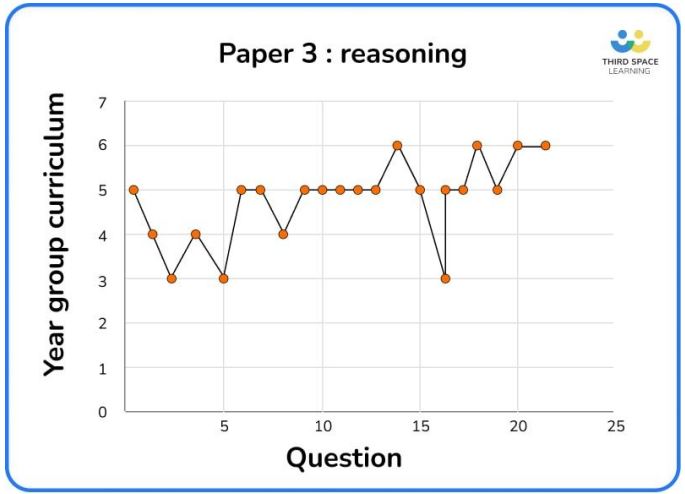
KS2 Maths SATs papers analysis Percentage of questions by content domain					
Content domain	2016	2017	2018	2019	2022
Number & PV	17	9	10	9	9
Calculations	17	22	29	30	38
FDP	15	14	14	24	25
Ratio & prop.	4	9	6	8	6
Algebra	8	9	9	6	3
Measurement	15	14	13	9	7
Shapes	12	9	10	7	6
Pos. & direction	4	3	4	3	2
Statistics	8	11	6	4	3

Topic			Marks /40		
Four operations	Addition / subtraction	Addition / subtraction	3	8	28
		Missing number	2		
		Decimals	3		
	Multiplication / division	Using known facts	6	19	
		Short division	1		
		Long division	4		
		Short multiplication	1		
		Long multiplication	4		
		Multiplication / Division by 10, 100, 1000	3		
	BIDMAS		1		
Fractions & Percentages	Fractions	Addition / subtracting proper fractions	3	9	12
		Addition / subtracting mixed numbers	3		
		Fraction of amount	2		
		Fractions divided by integer	1		
	% of amount		3		

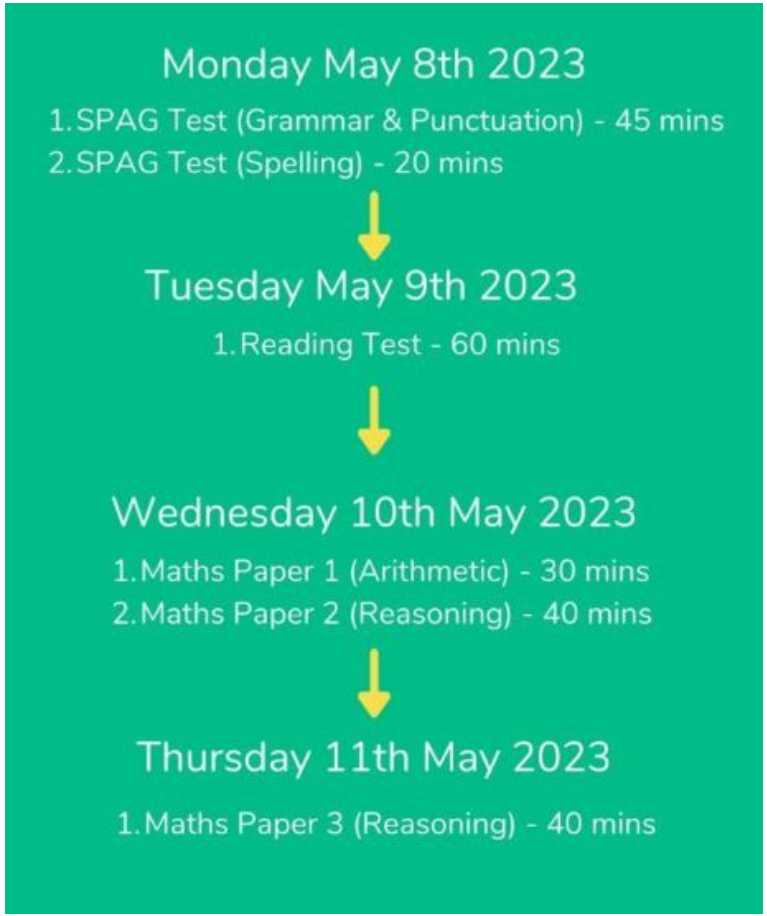
KS2 SATS Analysis







SATs 2023



Paper 1 - 40 marks
Paper 2 - 35 marks
Paper 3 - 35 marks
Total - 110 marks

On average, 60 marks is the pass mark and 95 is greater depth

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:

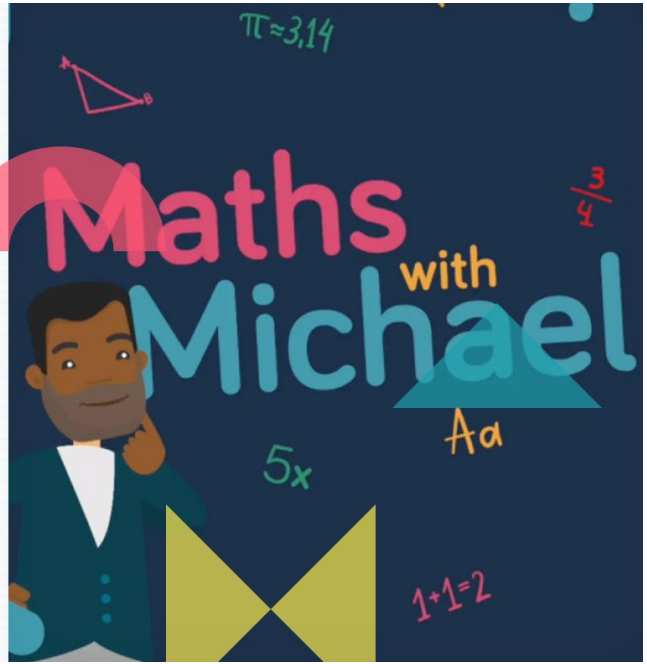
- Confident and able to recall and apply mathematical knowledge in different contexts
- Able to explain their methods and thinking processes and apply skills in context
- Fluent in different areas of maths
- Efficient in applying problem-solving and reasoning skills
- Independent thinkers
- Making number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

White Rose - Helpful Videos

Maths with Michael

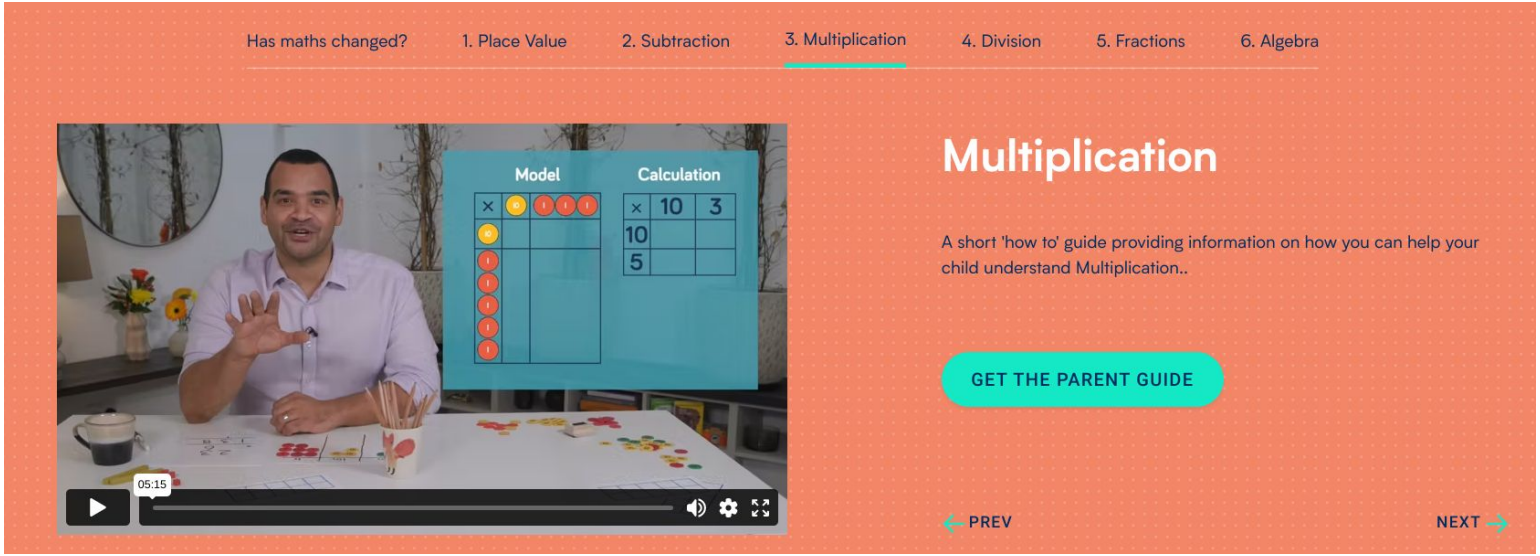
We've teamed up with TV presenter, teacher and parent Michael Underwood to bring you a mini-series called Maths with Michael.

WATCH THE SERIES



Maths with Michael - parent guides

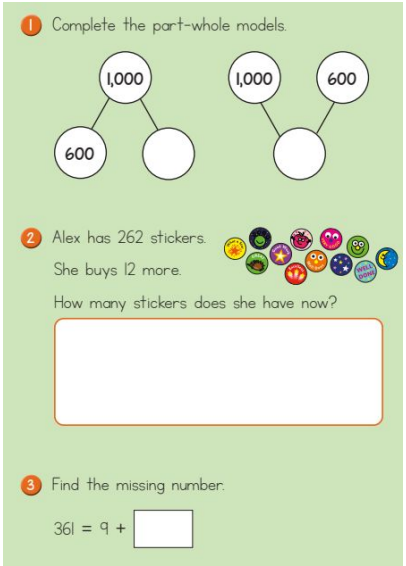
Each of the six sections has a useful guide with resources that can be printed.



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]



Manipulatives – what are they?

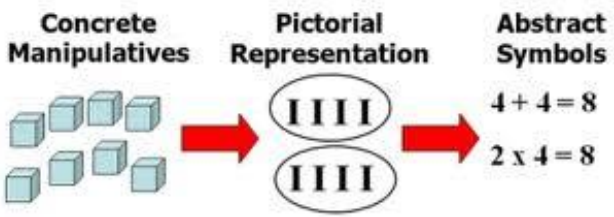
In maths, a **manipulative** is an object which is designed so that a learner can perceive some mathematical concept by manipulating it, hence its name. The use of manipulatives provides a way for children to learn concepts in a developmentally appropriate, hands-on and an experiential way.

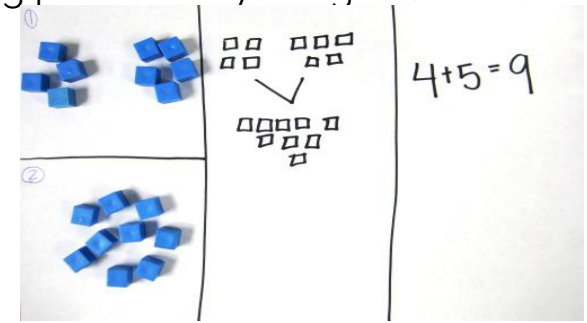
Concrete, pictorial, abstract

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 ÷ 2 = 6





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.

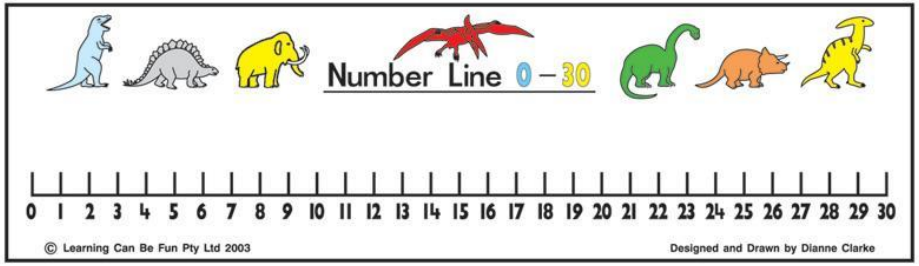
Numicon

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.

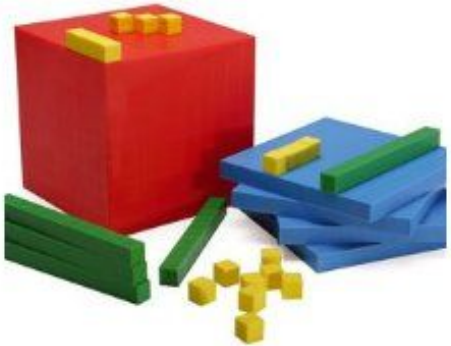
Other counting resources



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

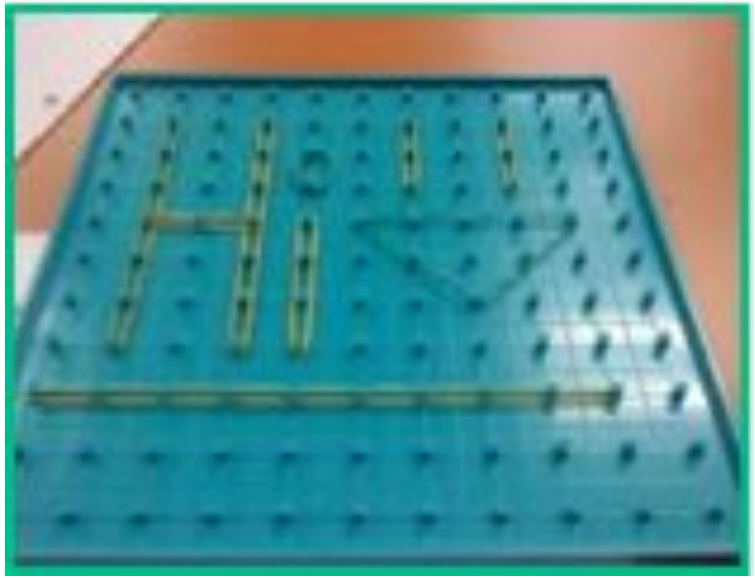


They are invaluable for helping children to develop an understanding of place value. They are also great for exploring the concept of regrouping in addition and subtraction and can even be used to model the process for long division.

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. 44 - 19 =

2. 45 ÷ 9 =

3. What is the area of this shape?

Relating maths to real life

What can we do as parents to help children relate maths to real life?

- Helping with shopping
- Budgets
- Cooking - measuring, timing, ratio
- Timetables for public transport
- Investigating shapes, areas and perimeters or things around the home

More examples for each year group will be shared later.

The key to successful maths

Arithmetic and reasoning

- Times tables and related division facts
- Four operations (+, -, x and ÷)
  - Whole numbers
  - Fractions
  - Decimals
- Applying their learning appropriately
- Relating to real life
- Using the correct language

Year 3

1. Make arrays

Arrays are shapes or objects arranged in a rectangle, such as a muffin tray or an egg box. Give your child some counters, buttons or beads, say 12. How many different arrays can they make? What calculations does each array show?

2. Play with food

Use foods with a regular shape (cake, pizza, cucumber slices) and ask questions like: *Let's cut this into 8 pieces, what fraction is each piece?*

Find fractions of amounts using foods such as fishfingers or biscuits: *There are 12 in the packet and 4 of us. What fraction can we each have? How many each is that?*

3. Hunt for treasure

Hide some 'treasure' in a room and blindfold your child. Give them directions to find the treasure, such as: *Turn two right angles clockwise, now take three steps forward.* Use whole, half, quarter and three-quarter turns clockwise and anti-clockwise.

Year 4

1. Find the negative!

Look for negative numbers to discuss with your child. For example, thermometers, weather reports, storage temperatures on frozen food packets, elevation of places below sea level, goal differences in sports league tables, below-ground floors in lifts, losing points in video games.

2. Play times tables games

Make two sets of number cards 1–12. Shuffle and place them face down in two piles. Take a number from each pile and multiply them together. Score a point for each correct answer. The first to 10 points wins.

3. Round at the shops

Practise rounding decimals with one decimal place to the nearest whole number when shopping. Challenge your child to round prices to the nearest pound. For example, an item costing £4·70 would be £5 to the nearest pound.

Year 5

1. Dice with decimals

Make '×' '÷' and '10', '100', '1000' cards to place face down in two piles. Roll a dice four times to create a number (e.g. 4258), then insert a decimal point somewhere (e.g. 42.58). Take a card from each pile and do the calculation (e.g. 42.58 ÷ 100 = 0.4258).

2. Play Battleship games

Play Battleships by drawing ships on coordinate grids. Try to sink each other's ships by guessing their positions using coordinates, such as (1,2). Remember that the first number in the coordinate bracket is on the horizontal *x*-axis. The second number is on the vertical *y*-axis.

3. Hit the sales

Sales in shops, catalogues or online are great for working with percentages. For example, in a 20% off sale, if the full price (that is 100%) of an item is £10, how much is the item discounted by (£2) and what will the sale price be (£8)?

Year 6

1. Look for large numbers

Talk about large numbers in the real world, such as house prices, electricity meter readings or football transfer values. When you see big numbers, ask your child to read them aloud. Can they write large numbers accurately if you say them?

2. Rewrite the recipe book

Cooking is a great way to explore ratio and proportion. Try adjusting recipes to make different quantities. For example, ask your child: 'A recipe uses 240 g of oats to make 18 flapjacks. What quantity of oats is needed for 24 flapjacks?'.

3. Find an average

Explore the 'mean' average in real life. Find a football team's mean number of goals per match by adding all the goals scored and dividing the total by the number of matches played. Or find the mean number of minutes the school run takes over a week.

Useful Websites

Third Space Learning

Manipulatives to use at home

Calculation policy - addition and subtraction

Calculation policy - multiplication and division