



# A Parents' Guide to Mathematics



*St. Joseph's Catholic Primary School: Respect, Friendship, Excellence, Care*

This booklet has been written to help you understand how mathematics is taught throughout our school. It is not intended as a list to work through and each stage should only be attempted when your child is ready. It also gives practical ideas, suggestions and vocabulary for helping at home.

We know that parents are keen to help with their child's education but may feel they do not understand what their child is doing as it is different to the way they were taught or find they confuse their children with their methods.

The days are gone when maths lessons were endless pages of calculations to be done in silence. Today, it is a lot more about collaboration and investigation. Children are taught why the methods work, not just how to perform them. It is the difference between telling someone directions and giving them a map.

So, use this guide to help you and your child gain confidence and remember to make maths fun!



## **Mastery in Mathematics**

At St. Joseph's we believe all children have the capability to become Masters at Maths. This thinking is called a 'growth mindset.' It allows children to understand that they have an unlimited maths potential and that being good at maths is all about working hard and not about being 'smart.' We praise their effort and their thinking rather than their achievement e.g. "Well done for your thinking." Below are the 7 principles of this growth mindset:

1. Everyone can learn maths to the highest level.
2. Mistakes are valuable.
3. Questions are really useful.
4. Maths is about creativity and making sense.
5. Maths is about connections and communicating.
6. Maths is about learning not performing.
7. Depth is more important than speed.

With this in mind we encourage our children to develop a greater depth of understanding rather than just working on the next topic. It is important for children to really grasp how to perform a procedure in many different ways and contexts rather than just working with greater numbers. So before exploring numbers to 100, consider the following with numbers to 10:

$$3 + 2 = \square$$

$$\square = 6 + 2$$

$$3 + \square = 4$$

$$\square + \square = 8$$

$$6 - \square = 2$$

$$5 = \square - 2$$

$$\square - \square = 7$$

$$5 - \square = 8 - \square$$


















## **Some Do's and Don'ts**

- ✓ Do make maths silly, gruesome or funny — get your child excited about maths questions e.g. I bet you don't know the answer?
- ✓ Do recognise there's more than one way of doing calculations — children's methods may be long winded or confusing, but you should always let them try their own way of solving a problem. Notice one method does not solve all calculations e.g. you would use different methods to find  $378 + 499$  to  $378 + 468$ .
- ✗ Don't expect children to 'get it' after you've explained once — it can take a long time for the 'penny to drop'. It is perfectly normal for children not to grasp a concept in a new context.
- ✗ Don't tell your child you are hopeless at maths — many adults claim that are not good at maths and this can give the message that maths is difficult, not enjoyable and ultimately not important to succeed in life. This just isn't true, as adults we deal with mathematics every day and cope with it. Just because you don't remember how to complete long division, doesn't mean you don't understand mathematics.
- ✓ Do encourage your child to be resilient and have a go at challenging themselves to build their learning power.
- ✗ When a child gets a question wrong, it is tempting to tell them they are wrong and how to correct it. Instead ask them to explain their method and help them spot their mistake.
- ✓ Similarly, if a child gets a question right, do get them to explain how they reached their answer; perhaps pretending not to understand.
- ✓ Do play maths with your child — board games or cards are full of maths and are an ideal way to engage mathematical thinking.
- ✓ Do let your child win, or be 'better than you' - of course you know your child best, so will know the correct balance of winning and losing, but you can compete against one another within a mathematical context e.g. I bet you can't get ready for bed in 5 minutes.
- ✓ Do make maths a casual part of what you do while you're doing something else — instead of making maths formal, find ways to sneak it in e.g. How many more plates do I need? Have we got enough money for the bread and milk? Did you see the number 23 bus?



## **Maths props to have at home**

-  Tape measure and ruler - get your child involved when completing DIY.
-  Bar of chocolate (with squares) - good for showing multiplication and fractions.
-  Magnet numbers - a great way for impromptu maths in the house.
-  Dartboard - darts teaches not only addition, subtraction and multiplication but also raises discussions of what is needed to finish the game.
-  Unusual dice - they don't have to be 6 sided.
-  Dominoes - another great game to show combinations of numbers
-  Guess who - this game shows how to group characters into categories and can be extended to shapes and numbers.
-  Thermometer - shows both positive and negative numbers to discuss.
-  A prominent clock - try using both an analogue and digital clock. Can you compare the two?
-  A wall calendar - not only good for noticing days and months, but also for finding patterns.
-  Board games with dice or spinner - why not make your own board game?
-  Pack of playing cards - not only can you learn about counting but also chance and probability.
-  Calculator - you can discover so many patterns with calculators, not just basic computation.
-  Measuring jug - discover both imperial and metric ways of measuring.
-  Scales - traditional balances can show counting as well as measuring.



## Minimum Expectations for Multiplication Tables

The teaching of times tables in the school is supported by the use of Times Table Rockstars. Mastery of a particular table group is shown by an accurate recall rate of below 3 seconds.

<b>x</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>1</b>	1	2	3	4	5	6	7	8	9	10	11	12
<b>2</b>	2	4	6	8	10	12	14	16	18	20	22	24
<b>3</b>	3	6	9	12	15	18	21	24	27	30	33	36
<b>4</b>	4	8	12	16	20	24	28	32	36	40	44	48
<b>5</b>	5	10	15	20	25	30	35	40	45	50	55	60
<b>6</b>	6	12	18	24	30	36	42	48	54	60	66	72
<b>7</b>	7	14	21	28	35	42	49	56	63	70	77	84
<b>8</b>	8	16	24	32	40	48	56	64	72	80	88	96
<b>9</b>	9	18	27	36	45	54	63	72	81	90	99	108
<b>10</b>	10	20	30	40	50	60	70	80	90	100	110	120
<b>11</b>	11	22	33	44	55	66	77	88	99	110	121	132
<b>12</b>	12	24	36	48	60	72	84	96	108	120	132	144

Y2 master  
1x, 2x,  
5x, 10x  
(Y1 to  
begin  
ASAP)

Y3 master  
3x, 4x,  
8x

Y4 master  
6x, 7x,  
9x, 11,  
12x



# Nursery



**The idea of mathematics for Nursery children can seem a bit daunting. However, at this age a lot of maths is about understanding ideas such as size, shape and pattern, things that most adults would not think of at all. If your child gains an early understanding of these concepts, then this can give him or her, a flying start with number work.**

**Shapes** Give your child opportunities to notice and recognise the different shapes around them. Use proper names when talking to children about 3D shapes and encourage them to find things in the house with the same shape. Look at road signs and discuss the different shapes you see.

**Counting/Money** Children enjoy counting real objects. Counting stairs as you take your child up to bed at night time, count buttons on clothes, count the number of apples into a shopping bag, count "pennies" in a money box and save up to buy something. Make up little games and ask your child to fetch 3 books, 4 spoons or do 5 claps, 2 jumps etc. Draw children's attention to numbers in everyday life. Look for numbers on cars, buses, clocks, houses, telephones. Show your child how to write numbers in a tray of sand or salt.

**Counting Rhymes** Recite nursery rhymes such as 12345 Once I Caught a Fish Alive and read counting books such as, The very hungry caterpillar by Eric Carle.

**Pattern** Helping lay the table encourages children to notice pattern, ie. 1 fork, 1 knife, 1 spoon, 1 plate in each space.

**Matching** Playing matching games with pairs of socks, shoes, gloves and picture cards can be fun. The ability to match lids to pans and tops of bottles is useful too. Talking with your child while doing an activity will help him/her develop vocabulary of words which describe positions e.g. Front, back, up, down, over, under. Use words such as big, little, long, short, heavy, light, to describe items when you are shopping for food and clothes.

**Sorting** Sort objects into colours, e.g. Smarties for cakes if you are baking, buttons or toys. Look out for certain colours, e.g. How many red cars do we see on our walk? Objects can be sorted for size, shape and function too. A collection of seasonal items is useful for developing sorting skills e.g. Leaves in Autumn, shells in Summer, cards at Christmas. Encourage children to notice similarities and differences between things.

**Maths at bath time** At bath time let children fill different sized bottles with water and discover which holds the most.

**Time** Talk to your child about events in the day, morning, afternoon and night.

**Measuring and weighing** Children like to help with cooking, let them measure ingredients with a cup or spoon and watch you using the scales to weigh and balance. If possible set the time on your cooker to beep when food is ready, this will help make your child aware that it sometimes takes a length of time to cook food.



## 5 Currant Buns



5 currant buns in a baker's shop,  
Round and fat with a cherry on the top,  
Along came (use child's name) with a penny one day,  
Bought a currant bun and took it away.

(Repeat, counting down by one each time)

## Five Little Monkeys

Five little monkeys jumped on the bed,  
One fell off and bumped his head,  
Mama called the doctor,  
And the doctor said,  
"No more monkeys jumping on the bed!"



## Once I Caught A Fish Alive

One, two, three, four, five,  
Once I caught a fish alive.  
Six, seven, eight, nine, ten,  
Then I let it go again.  
Why did you let it go?  
Because it bit my finger so.  
Which finger did it bite?  
This little finger on my right.



## Five Little Ducks

Five little ducks went swimming one day  
Over the hill and far away  
Mother duck said, "Quack quack quack quack"  
And only four little ducks came back!

Four little ducks went swimming one day  
Over the hill and far away  
Mother duck said, "Quack quack quack quack"  
And only three little ducks came back!

Three little ducks went swimming one day  
Over the hill and far away  
Mother duck said, "Quack quack quack quack"  
And only two little ducks came back!

Two little ducks went swimming one day  
Over the hill and far away.  
Mother duck said, "Quack quack quack quack"  
And only one little duck came back!

One little duck went swimming one day  
Over the hill and far away  
Mother duck said, "Quack quack quack quack"  
And all her five little ducks came back!

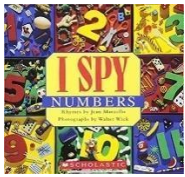


## Five Speckled Frogs

Five little speckled frogs  
Sat on a speckled log  
Eating the most delicious  
bugs (yum yum)  
One jumped into the pool  
Where it was nice and cool  
Then there were four green  
speckled frogs. (glub glub)

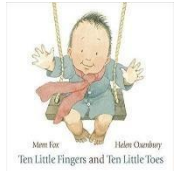


**The books in this list can be used in the Early Years to explore different aspects of number.**



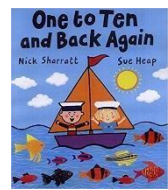
### **I spy Numbers**

In this book, each photograph contains a big numeral from 1 to 9 surrounded by lots of small objects. Can you see how each object is related to the number in the middle?



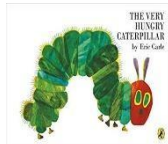
### **Ten Little Fingers and Ten Little Toes**

This book offers a context in which to count to 10 using pictures of children from all over the world, as well as the reader's own fingers and toes.



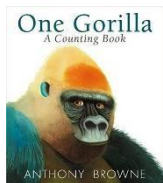
### **One to Ten and Back Again**

The colourful pictures in this book tell the story of two friends, Nick and Sue, who show us all their favourite things by counting them from one to ten and back.



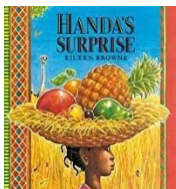
### **The Very Hungry Caterpillar**

In this engaging classic picture book, children are invited to use their fingers to explore the numbers up to five.



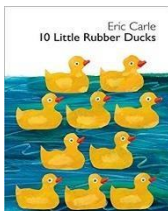
### **One Gorilla**

One gorilla, two orangutans, three chimpanzees... This counting to ten book focuses on members of the primate family.



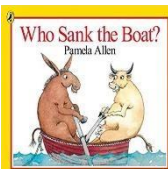
### **Handa's Surprise**

Handa carries a basket of seven different fruits to her friend. As she makes her journey, seven different animals each steal a fruit from her basket! This richly illustrated book is an engaging context in which children can explore the concept of 'one less'.



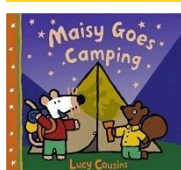
### **10 Little Rubber Ducks**

Find out what happens to a box of ten rubber ducks after they fall off a cargo ship. This book offers a context in which to explore counting and ordinal numbers.



### **Who Sank the Boat?**

In this book, five animals get into a boat - but which animal causes the boat to sink?



### **Maisy Goes Camping**

Maisy and her friends put up a tent to go camping in. But how many of them can fit in the tent at once?

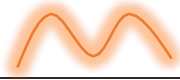


# Reception



## + Addition

$1 + 2 = 3$



0 1 2 3 4 5



Allow children to count these objects.

Written

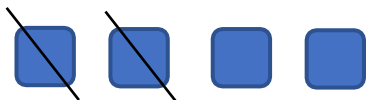


$1 + 2 = 3$

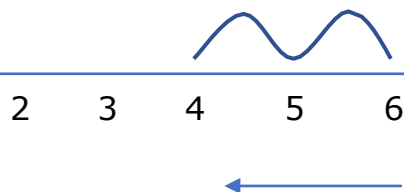
- Use physical objects - toys, counters, cubes, to help children count mentally.
- Encourage children to put them into rows.
- Build up children counting 2 sets of objects practically.
- Children start with the biggest group first.
- Adding 1 more object.
- From objects move onto pictures.
- Children can still use objects when it is written.
- When confident, children move onto a number line.
- Children move in jumps of 1 using their finger to help.
- Children count the jumps for the answer.

## - Subtraction

$4 - 2 =$



$6 - 2 = 4$



- Explain to children that subtraction is to take away.
- Use physical objects, games, songs and practical activities to help children gain a good understanding of subtraction and vocabulary used.
- Encourage children to physically take objects away. eg: 1 less.
- Children start with the biggest group first and when recording children can cross out pictures.
- When children are confident children can use a number line.
- Children start with the biggest number and count back. e.g.: 9 - 3. Start at 9 on the number line and count back in 1's 3 jumps.

## x Multiplication



Children will use objects to count.

- Children will count in 2's, 5's and 10's orally.
- Children will use objects to help them count.
- Encourage children to learn songs, rhymes and use visual aids.

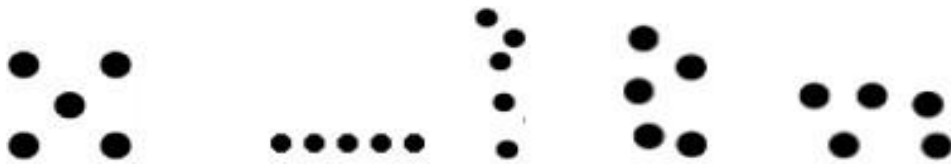
## ÷ Division



Children cut out 6 cakes and share them equally between two people.

- Children learn songs rhymes and use visual aids.
- Children will practically group objects. E.g.: Children will cut and stick pictures to share.
- Children will practically share objects between two.
- Children will gain an understanding of halving when practically sharing objects.

# Examples of deeper understanding

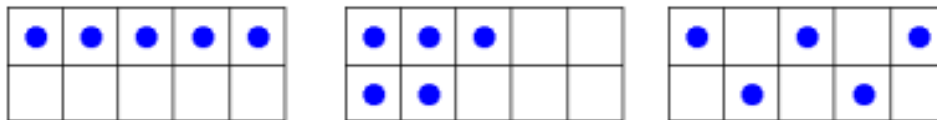


## Recognising amounts

Another skill that is very important is recognising small amounts without the need to count them. Initially this should be by using concrete objects such as those shown above but as children progress, allowing them to see groups of dots in different arrangements helps them to mentally 'see' how many objects are there without needing to count. This is a very important skill when children begin to add and subtract. Using dice is a good way to practise this skill before moving onto objects in different arrangements.

## Understanding that the total stays the same even when the objects move

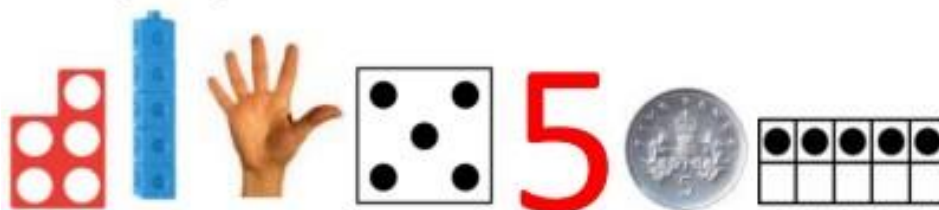
When children first start to use numbers, they often do not understand that if we move objects into another arrangement the total stays the same. We practise this with many different types of objects but a useful tool is using a tens frame to be able to move counters around.



## Representing Numbers

We want to develop children's number sense so that they understand the number rather than just recognising the numeral. Children need to understand that numbers can be represented in many ways, not just as a written numeral. We use many different objects and pictures to show that numbers can be represented in lots of ways.

## Some ways to represent five





# Year One

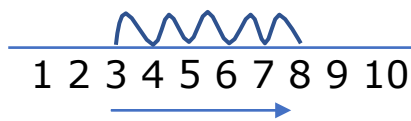
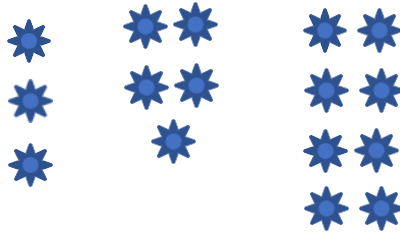


## + Addition

1st term - Practically.  
Spring - number lines drawn.  
Counting on.

Use objects or counters.

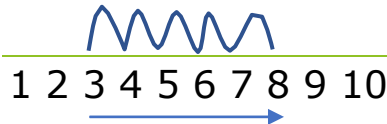
$$3 + 5 = 8$$



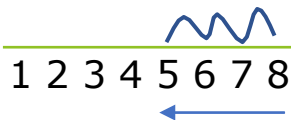
- In the Autumn term children add numbers using objects or pictures and mentally add together.
- In Spring children use number lines to count on from the first number.
- Start at 3 on the number line and count in ones - 4, 5, 6, 7, 8.

## - Subtraction

$$8 - 3 = 5$$



$$8 - 3 = 5$$



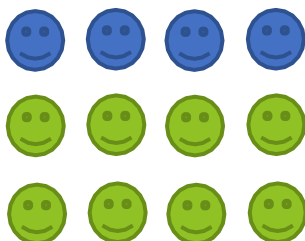
- Start with the lowest number. E.g.: 4
- Children taught to count up/find the difference.
- Children count up from 4 in jumps of 1 to get to 10.
- They then count the jumps to get the answer.
- Children are taught to count back.
- Children start with the biggest number and count back e.g: 12-4. Start at 12 on the number line and count back in 1's 4 jumps.



## x Multiplication

2, 5, 10

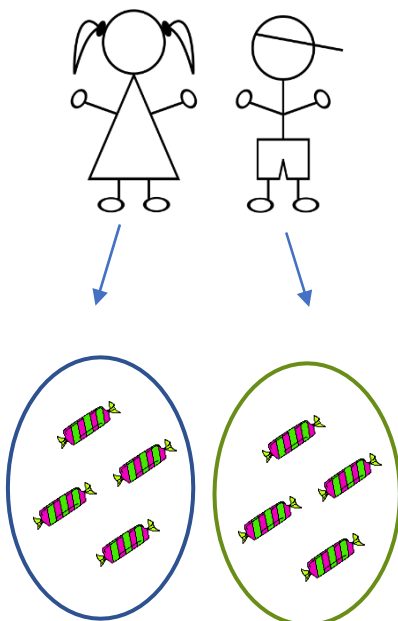
$$3 \times 4 = 12$$



- Autumn term children work practically with objects, pictures or mentally.
- Spring term children record arrays e.g.:  $2 \times 4 = 8$
- 2 rows of 4 or 4 columns of 2. This gives children an image of the answer.
- It also helps develop the understanding that  $2 \times 4$  is equivalent to  $4 \times 2$ .

## ÷ Division

$$8 \div 2 = 4$$



- Children work practically with objects, pictures and arrays! In Spring children start to record.
- Children should solve a division problem within context.
- Children should use equipment to share objects and separate them into groups.
- E.g.: 6 sweets are shared between 2 people, how many do they each get?
- Children may solve by using 'one for me', 'one for you' strategy until all the sweets have been given out.
- Children should answer by counting how many sweets 1 person has got.
- $8 \div 2 = 4$  how many groups of 2 are there in 8?
- Children draw 2 circles and share 10 between the 2 circles by drawing dots.
- Children count how many in each group.

# Examples of deeper understanding

Complete:

5	10				30
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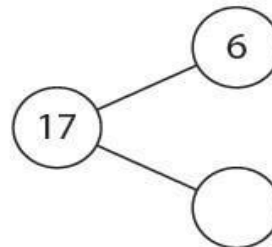
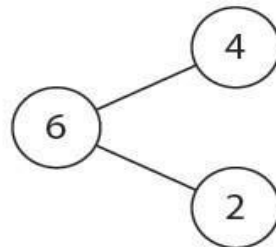
	4	6			12
--	---	---	--	--	----

			40	50	60
--	--	--	----	----	----

Place

Value

Complete:



Addition and  
Subtraction

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Fill in the missing numbers:

$$3 + 5 + \square = 10$$

$$1 + 5 + \square = 10$$

Anna is counting in fives:

5, 10, , 20, , , ...

Multiplication and  
Division

Fill in the missing numbers.

Anna says if she keeps on counting in fives she will say the number 54. Is she right or wrong?

Can you explain?



# Year Two



## + Addition

$$43 + 35 =$$

$$40 + 30 = 70$$

$$3 + 5 = 8$$

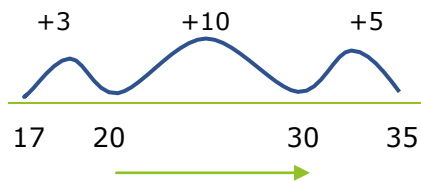
$$40 + 30 + 8 = 78$$

- Children partition (split) number into tens and ones.  
E.G.: 32 30 + 2
- Tens numbers are added.
- Ones numbers added.
- Totals are then recombined.

## - Subtraction

Counting On.

$$35 - 18 = 17$$



$$3 + 10 + 5 = 18$$

- Start with the lowest number.
- Children count on to the next multiple of ten and record number in the jump.
- Count in tens to the final multiple of ten, then add ones.
- Numbers in jumps are added together to find the difference.

## x Multiplication

$$3 \times 5 =$$



$$13 \times 5 =$$

$$10 \times 5 = 50$$

$$3 \times 5 = 15$$

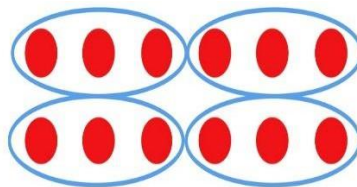
$$50 + 10 + 5 = 65$$

- Children continue to record in arrays. E.g.:  $3 \times 5 = 15$
- Children draw 3 rows of 5 or 5 columns of 3.

- Children then use the partitioning method to multiply when multiplying by a single digit.
- Partition 15 (10 and 5) and use known facts to multiply by 5.
- $10 \times 5 = 50$
- $3 \times 5 = 15$
- Add the answers together by recombining.
- $50 + 10 + 5 = 65$

## ÷ Division

$$12 \div 4 =$$



Towards Summer Term

$$\begin{array}{r} \underline{21} \\ 3 \ ) \ 63 \end{array}$$

- Children will continue to use practical equipment to represent division calculation.
- Children need to understand that  $18 \div 3$  reads as 'How many groups of 3 are there in 18?' or 18 divided into groups of 3.

- Children will draw 3 circles and share by drawing 18 dots between the 3 circles.
- Children will then count how many dots are in the circle to give them the answer.

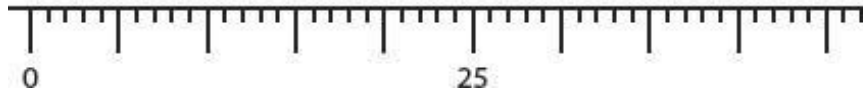
Towards Summer Term:

- Simple divisions linked to tables without remainders should be carried out.
- $63 \div 3 = 21$
- How many groups of 3 are there in 6? 2 Write 2 above the 6 on the line.
- How many groups of 3 are there in 3? 1. Write 1 above the 3 on the line.
- Answer is 31.

## Examples of deeper understanding

Place these numbers on the number line:

10, 48, 30



Place

Value

**What do I need to add or subtract from each of these numbers to total 60?**

**40, 44, 66, 69, 76, 86, 99, 89, 79.**

Addition and  
Subtraction

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Two friends share 12 sweets equally between them. How many do they each get?

Write this as a division number sentence.

Make up two more sharing stories like this one.

Chocolate biscuits come in packs (groups) of 5. Sally wants to buy 20 biscuits in total. How many packs will she need to buy?

Write this as a division number sentence.

Make up two more grouping stories like this one.

Multiplication and  
Division



# Year Three



## + Addition

Children should add numbers with up to 3 digits.

$$\begin{array}{r} \text{T O} \\ + \underline{\text{H T O}} \\ \hline \end{array}$$

$$\begin{array}{r} \text{H T O} \\ + \underline{\text{H T O}} \\ \hline \end{array}$$

2 Digits

$$\begin{array}{r} 23 \\ + 52 \\ \hline 75 \end{array} \quad \begin{array}{r} \overset{1}{4}7 \\ + 76 \\ \hline 123 \end{array}$$

3 Digits

$$\begin{array}{r} \overset{1}{2} \overset{1}{7} 5 \\ + 547 \\ \hline 822 \end{array}$$

$$\begin{array}{r} \overset{1}{6} 57 \\ + 516 \\ \hline 1173 \end{array}$$

- + on the left.
- Lined up accordingly to place value (tens above tens.)
- Carry above the top numbers.
- Cross out the carrying number when added on (so we don't forget.)
- Reinforce the importance of 0 as a place holder 1st on the left.

## - Subtraction

Children should subtract numbers up to 3 digits.

$$\begin{array}{r} \text{T O} \\ - \underline{\text{H T O}} \\ \hline \end{array}$$

$$\begin{array}{r} \text{H T O} \\ - \underline{\text{H T O}} \\ \hline \end{array}$$

$$\begin{array}{r} 85 \\ - 51 \\ \hline 34 \end{array} \quad \begin{array}{r} \overset{5}{6} \overset{1}{4} \\ - 28 \\ \hline 36 \end{array}$$

$$\begin{array}{r} \overset{7}{8} \overset{1}{4} 8 \\ - 577 \\ \hline 271 \end{array} \quad \begin{array}{r} \overset{6}{7} \overset{19}{0} \overset{1}{5} \\ - 358 \\ \hline 347 \end{array}$$

- Lined up according to place value (tens above tens)
- When borrowing, cross the original number out and write the new number above.
- For example: 8 is larger than 4 so you can't take it away from 4. There are 6 tens in the 64, change one of the tens into ten ones. Now you have 14-8. You still have 64 in total but instead of being 60+4 it is now 50+14.
- Reinforce the importance of 0 as a place holder.
- Remember sometimes both tens and ones need to borrow.
- Sometimes you may carry numbers greater than 1.



## x Multiplication

$$O \times O$$

$$\begin{array}{r} T O \\ x \quad O \\ \hline \hline \end{array}$$

$$4 \times 6 = 24$$

$$\begin{array}{r} + \\ 36 \\ x \quad 3 \\ \hline 108 \end{array}$$

$$\begin{array}{r} + \\ 56 \\ x \quad 4 \\ \hline 224 \end{array}$$

- x on the left.
- All multiplication tables should be done mentally.
- Multiply the ones first, then the tens number.
- Carry above the number and remember to cross out when we have added it.

## ÷ Division

Children

$$T O \div O$$

Children

$$15 \div 3 = 5$$

$$\begin{array}{r} 32 \\ 2)64 \end{array}$$

$$\begin{array}{r} 21 \text{ r}2 \\ 3)65 \end{array}$$

- Simple division linked to tables without remainders should be carried out mentally
- 'Short division'.  
For example:  $65 \div 3 =$ 
  - How many groups of 3 are there in 6? 2. Write the 2 above the 6 on the line.
  - How many groups of 3 are there in 5? 1 group of 3 and there are 2 more to reach 5. Write 1 above the 5 on the line. There is 2 remainder so place an r 2.

Answer is 21 r 2.

# Examples of deeper understanding

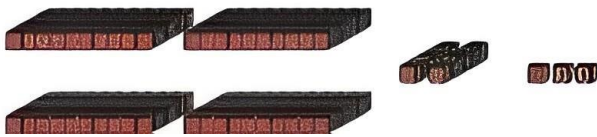
What number is represented in each set?



Place



Value



Addition and  
Subtraction

Solve calculations using a place value grid and equipment alongside a column method to demonstrate understanding.

Hundreds place	Tens place	Ones place

325
+ 247
_____
_____

Sam has completed these calculations, but he is incorrect. Explain the errors he has made.

325	355
+ 247	- 247
581	112

Complete the following:

$3 \times \square = 12$

$4 \times \square = 20$

$\square \times 3 = 15$

$8 \times \square = 24$

Multiplication and  
Division



# Year Four



## + Addition

Children should add numbers up to 4 digits.

$$\begin{array}{r} \phantom{+} \uparrow \phantom{+} \uparrow \\ 4567 \\ + 1345 \\ \hline 5912 \end{array}$$

- + on the left.
- Lined up according to place value (tens above tens).
- Carry above the top number.
- Cross out the carrying number when added on (so we don't forget).

## - Subtraction

Children should subtract digits up to 4 digits

$$\begin{array}{r} \phantom{-} \overline{7} \phantom{19} \overline{19} \phantom{1} \overline{1} \\ 8005 \\ - 3257 \\ \hline 4748 \end{array}$$

- - on the left.
- Lined up according to place value (tens above tens).
- When 'borrowing' cross the original number out and write the new number above.
- E.g.: 7 is larger than 5 so you can't take it away from 5. Move along the digits turning the 0's into 10's.
- Ask the tens to borrow which turns into 9's  
 $15 - 7 = 8$

## x Multiplication

H T O x O

$$\begin{array}{r} \overset{1}{6} \overset{2}{2} 4 \\ \times \quad \quad 5 \\ \hline 3120 \end{array}$$

- X on the left.
- Multiply the units first, then by the tens numbers and then by the hundreds.
- Carry the number.
- Remember to cross out numbers you 'carry' when you add them on.

## ÷ Division

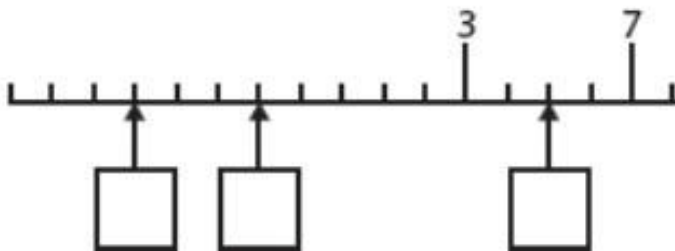
H T O ÷ O

$$\begin{array}{r} \underline{124} r1 \\ 3 \overline{)373} \end{array}$$

- Short division.
- For example:  $373 \div 3$
- How many groups of 3 are there in 3? 1. Write the line.
- How many groups of 3 are there in 7? 2 groups and there is 1 more to reach 7 write the 2 above the 7 on the line.
- How many are left over? 1. Write the 1 next to the 3.
- How many groups of 3 are there in 13? 4 groups and there is 1 more to reach 13. Write 4 above the 3 on the line. There is 1 remainder, so place an r1.

## Examples of deeper understanding

Write the missing numbers in the boxes.



Place

Value

Fill in the missing numbers.

Addition and  
Subtraction

$$352 + \boxed{\phantom{000}} = 480$$

$$70 + 99 + \boxed{\phantom{000}} = 270$$

$$\boxed{\phantom{000}} - 55 = 84$$

$$\boxed{\phantom{000}} - 3000 = 600$$

What do you notice about the following calculations? Can you use one calculation to work out the answer to other calculations?

$2 \times 3 =$

$6 \times 7 =$

$9 \times 8 =$

$2 \times 30 =$

$6 \times 70 =$

$9 \times 80 =$

$2 \times 300 =$

$6 \times 700 =$

$9 \times 800 =$

$20 \times 3 =$

$60 \times 7 =$

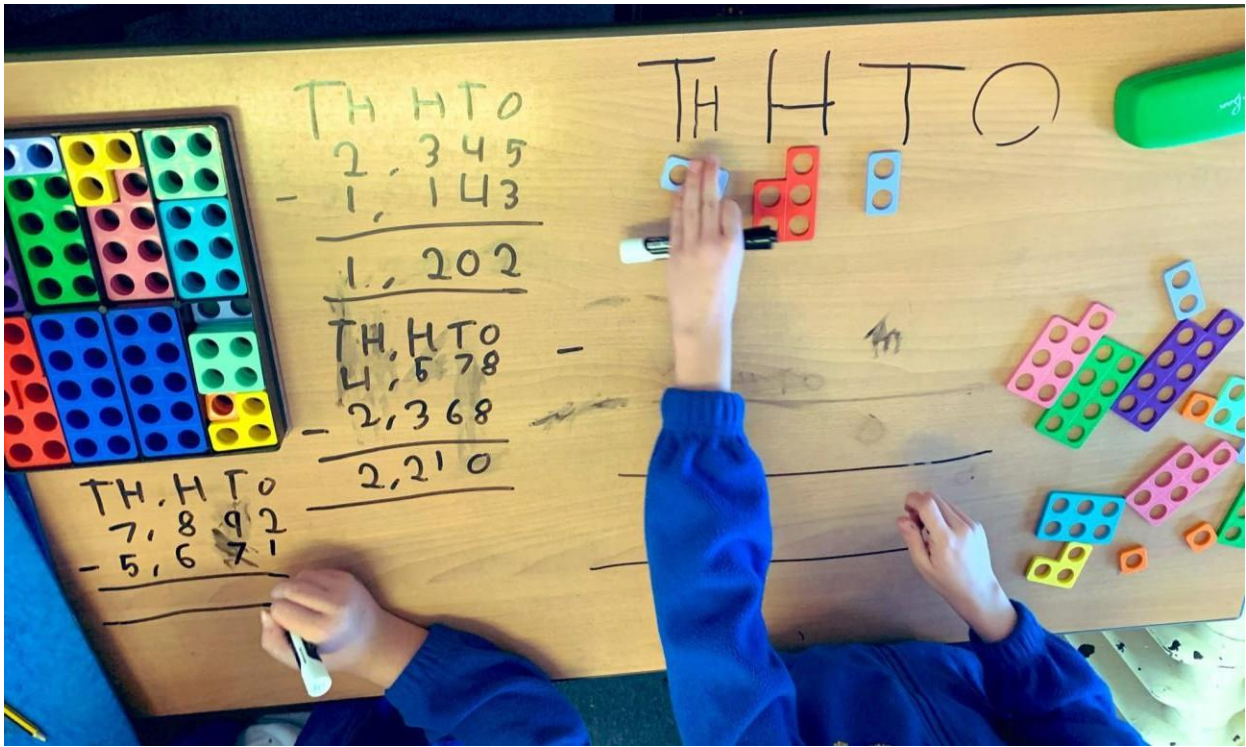
$90 \times 8 =$

$200 \times 3 =$

$600 \times 7 =$

$900 \times 8 =$

Multiplication and  
Division



# Year Five



## + Addition

Children should add whole numbers with more than 4 digits.

- Decimals

$$\begin{array}{r} \phantom{+} 21984 \\ + 42539 \\ \hline 64523 \end{array}$$

$$\begin{array}{r} 51.71 \\ + 9.63 \\ \hline 61.34 \end{array}$$

- + on the left.
- Lined up according to place value (tens above tens)
- Carry above the top numbers.
- Cross out the carrying numbers when added on (so we don't forget).
- Adding decimals.
- + on the left.
- Lined up according to place value. Make sure decimal points are lined up.
- Add a 0 in to fill the gaps.

## - Subtraction

Children should subtract whole numbers with more than 4 digits.

- Decimals

$$\begin{array}{r} \phantom{-} 52524 \\ - 23557 \\ \hline 28977 \end{array}$$

$$\begin{array}{r} 13.51 \\ - 8.54 \\ \hline 4.97 \end{array}$$

- - on the left.
- Lined up according to place value (tens above tens). Decimal numbers - arrange numbers around decimal point.
- Decimal subtraction - add a 0 to fill in the gaps.
- When 'borrowing' cross the original number out and write the new number above. E.g.: 1 - 4 you can't, so borrow from the 5 making it 4 tenths and place 1 above the 1. 11 - 4 = 5. Remember you may need to borrow from the number to the left, that is fine.



## x Multiplication

T O x O  
H T O x T O  
H T O

Short Multiplication

$$\begin{array}{r} \overset{3}{3} \overset{1}{5} 3 1 \\ \times \quad \quad \quad 6 \\ \hline 2 1 1 8 6 \end{array}$$

Long Multiplication

$$\begin{array}{r} \overset{4}{8} \overset{1}{7} 3 \\ \times \quad \quad \quad 4 6 \\ \hline 5 2 3 8 \\ + \overset{1}{3} \overset{1}{4} 9 2 0 \\ \hline 4 0 1 5 8 \end{array}$$

- x on the left.
- Multiply the ones / units first, then tens, then hundreds and then thousands.
- Carry above the number and cross out the numbers you carry when you add them on.

Long Multiplication

- x on the left
- Multiply the unit of the bottom number by the units, tens and hundreds of the top number. When carrying place on top unit, cross out when added.
- Add a 0 on the second line and multiply the tens digits (4) by the units, tens and hundreds of the top line.
- When carrying place on the line.
- Adding the two rows of answers carry above the answer.

## ÷ Division

Th H T O ÷ O

Th H T O ÷ T O with remainder

$$\begin{array}{r} 0 6 9 5 \\ 4 \overline{) 2 7 8 0} \end{array}$$

$$\begin{array}{r} 0 1 7 6_{r8} \\ 12 \overline{) 2 1 2 0} \end{array}$$

### Short Division

$$2780 \div 4$$

$2 \div 4 = 0$  remainder 2 put 2 next to the 7.

$27 \div 4 = 6$  remainder 3. Put the 6 above the 7 on the line. Put the 3 next to the 8.

$38 \div 4 = 9$  remainder 2. Put the 9 above the 8 on the line. Put the 2 next to the 0.

$20 \div 4 = 5$ . Put the 5 above the 0 on the line.  $2 \div 12 = 0$  remainder 2.

Put a 0 above the 2 on the line and 2 next to the 1.

$21 \div 12 = 1$  remainder 9. Put 1 on the line and 9 next to 2.

$92 \div 12 = 7$  remainder 8. 7 above 2 and put 8 next to 0.

$80 \div 12 = 6$  remainder 8. Place remainder on the line with an 8 beside it.

## Examples of deeper understanding

What can we say about 48,000?

It is \_\_\_\_\_ less than 50,000.

It is made of 40,000 and \_\_\_\_\_ together.

It is made of \_\_\_\_\_ thousands.

It is made of \_\_\_\_\_ hundreds.

It is made of \_\_\_\_\_ tens.

Place

Value

*Example of deeper understanding:*

*Set out and solve these calculations using a column method.*

$$3254 + \quad = 7999$$

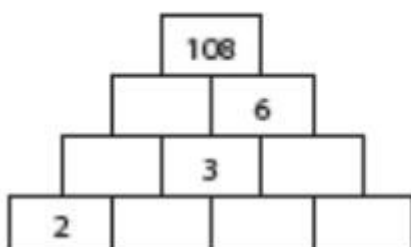
$$2431 = \quad - 3456$$

$$6373 - \quad = 3581$$

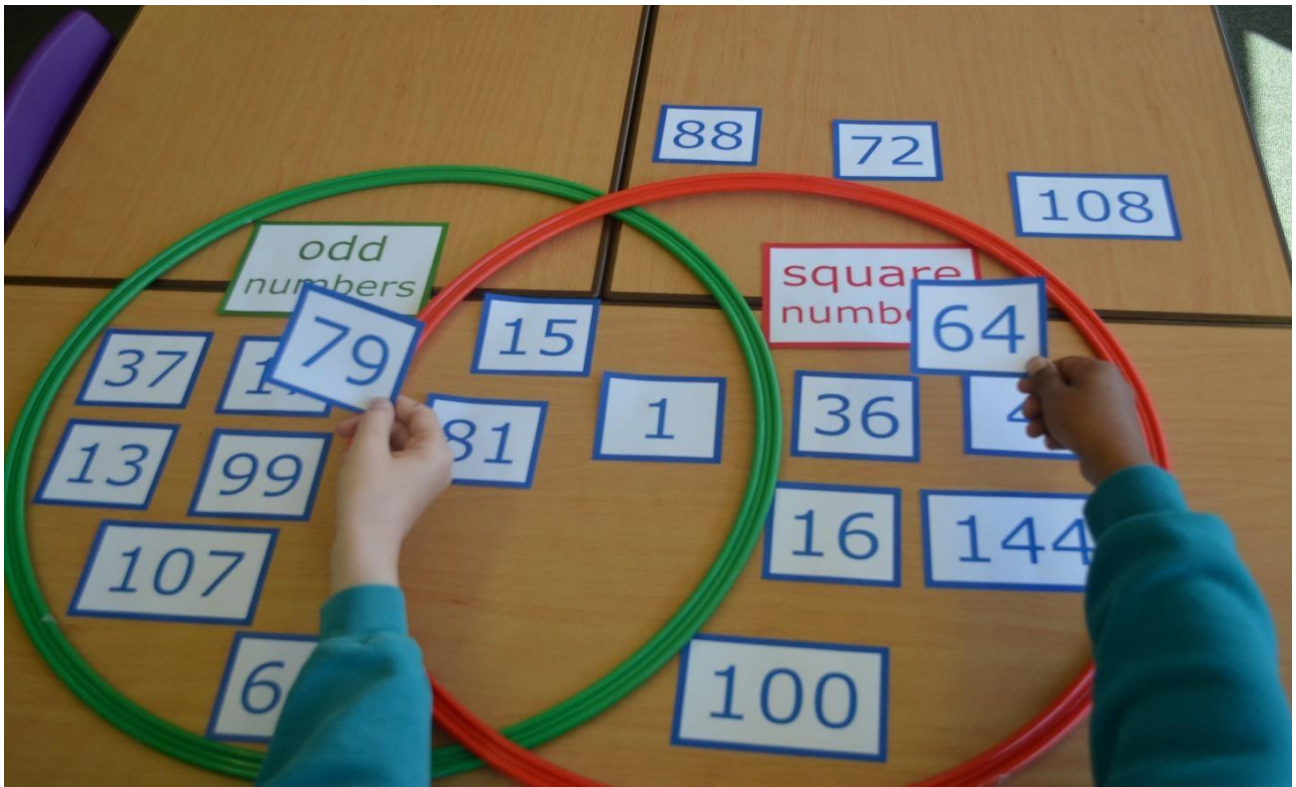
$$6719 = \quad - 4562$$

Addition and  
Subtraction

Fill in the missing numbers in this multiplication pyramid.



Multiplication and  
Division



# Year Six



<p><b>+ Addition</b></p>	$  \begin{array}{r}  \begin{array}{cccccc}  \nearrow & \nearrow & \nearrow & \nearrow & \nearrow & \\  4 & 4 & 8 & 4 & 8 & 5 \\  + & 3 & 9 & 7 & 7 & 3 & 6 \\  \hline  8 & 4 & 6 & 2 & 2 & 1  \end{array} \\  \\  \begin{array}{r}  \begin{array}{cccccc}  \nearrow & & \nearrow & \nearrow & & \\  5 & 9 & . & 4 & 6 & 5 \\  + & 6 & 5 & . & 2 & 7 & 7 \\  \hline  1 & 2 & 4 & . & 7 & 4 & 2  \end{array}  \end{array}  $	<ul style="list-style-type: none"> <li>• + on the left.</li> <li>• Lined up according to place value</li> <li>• Carry above the top numbers.</li> <li>• Cross out the carrying numbers when added on (so we don't forget).</li> <li>• Adding decimals.</li> <li>• + on the left.</li> <li>• Write the calculation using place value to line up the digits.</li> <li>• Make sure decimal points are lined up.</li> <li>• Work from thousandth column and carry above the top number.</li> </ul>
<p><b>- Subtraction</b></p>	$  \begin{array}{r}  \begin{array}{cccccc}  5 & 13 & 15 & 1 & 7 & 1 \\  \cancel{6} & \cancel{4} & \cancel{6} & \cancel{1} & \cancel{8} & \cancel{1} \\  - & 3 & 8 & 8 & 4 & 5 & 4 \\  \hline  2 & 5 & 7 & 7 & 2 & 7  \end{array} \\  \\  \begin{array}{r}  \begin{array}{cccccc}  5 & 12 & & 10 & 11 & 1 \\  \cancel{9} & \cancel{4} & . & \cancel{1} & \cancel{2} & \cancel{5} \\  - & 2 & 6 & . & 8 & 7 & 8 \\  \hline  4 & 6 & . & 2 & 6 & 7  \end{array}  \end{array}  $	<ul style="list-style-type: none"> <li>• - on the left.</li> <li>• Lined up according to place value. When subtracting decimal arrange numbers around decimal points.</li> <li>• When 'borrowing' cross the original number out and write the new number above.</li> <li>• When subtracting whole numbers start from the ones. As the bottom number is larger borrow from the 8 tens leaving 7 tens and place 1 above the 1.</li> <li>• 11 - 4 = 7. Remember you can borrow from the number on the left.</li> </ul>
<p><b>x Multiplication</b></p>	$  \begin{array}{r}  \begin{array}{r}  \begin{array}{cccc}  \cancel{8} & \nearrow & \cancel{2} & \\  1 & 8 & 2 & 7 \\  \times & & 2 & 4 \\  \hline  \begin{array}{cccc}  \nearrow & & \nearrow & \\  7 & 3 & 0 & 8 \\  \\  3 & 6 & 5 & 4 & 0 \\  \nearrow & & & & \\  \hline  4 & 3 & 8 & 4 & 8  \end{array} \\  \\  \begin{array}{r}  \begin{array}{cccc}  3 & & 1 & \\  2 & . & 5 & 2 \\  \times & & & 6 \\  \hline  15 & . & 1 & 2  \end{array}  \end{array}  \end{array}  $	<ul style="list-style-type: none"> <li>• X on the left.</li> <li>• Multiply the ones of the bottom number by the ones, tens, hundreds and thousands.</li> <li>• Carry above the top number and cross out when added.</li> <li>• Before multiplying by the tens add a 0 on the right of the second row. This is because we want to multiply by 20 (2 tens.)</li> <li>• Multiply 2 tens by the ones, tens, hundreds and thousands.</li> <li>• When carrying place on the line, don't forget to cross out when added.</li> <li>• Add the two rows of answers and carry above the answers.</li> </ul>

## ÷ Division

### Decimal short division.

$$\begin{array}{r} 0.7 \\ 6 \overline{)4.2} \end{array}$$

### Short division with a fraction remainder

$$\begin{array}{r} 0635 \frac{6}{7} \\ 7 \overline{)4451} \end{array}$$

### Short division with decimal remainders

$$\begin{array}{r} 0697.75 \\ 4 \overline{)2791.00} \end{array}$$

### Long division

$$\begin{array}{r} 235r6 \\ 12 \overline{)2826} \\ \underline{24} \phantom{00} \\ 42 \phantom{00} \\ \underline{36} \phantom{00} \\ 66 \phantom{00} \\ \underline{60} \phantom{00} \\ 6 \phantom{00} \end{array}$$

### Short division with fraction remainders

- $4 \div 7 = 0$  remainder 4. Put the 0 above the line and the 4 next to the 4.
- $44 \div 7 = 6$  remainder 2. Place the 6 above the line and the 2 next to the 5.
- $25 \div 7 = 3$  remainder 4. Place the 3 on top of the line and 4 next to the 1.
- $41 \div 7 = 5$  remainder 6. Place the 5 on the line and write the remainder as a fraction.

E.g.:

$$\frac{6}{7} \quad \text{Top number (numerator) is the remainder.}$$

The bottom number (denominator) of the fraction needs to be the number you were dividing by.

### Short division with decimal remainder.

- $2 \div 4 = 0$  remainder 2. Place the 0 on the line and 2 next to the 7.
- $27 \div 4 = 9$  remainder 3. Place the 6 on the line and the 3 next to the 9.
- $39 \div 4 = 9$  remainder 3. Place the 9 on the line and the 3 next to the 1.
- $31 \div 4 = 7$  remainder 3.
- Add a decimal point and a 0 after the point. Place the remainder 3 next to the 0.
- $30 \div 4 = 7$  remainder 2. Place a decimal point on the answer line and put 7 after it.
- Place another 0 with a 2 beside it.

### Long Division

- Set out the calculation. Start by looking at the first two digits of 2,826.
- Divide 28 by 12 to find how many times 12 goes into 28. Write 2 above the line in the answer and place as is shown. Find the remainder: 4. Bring down the digit 2.
- Divide 42 by 12 to find how many times 12 goes into 42.
- Write 3 above the line in the answer space and record 36 (12x3) below 42.
- Subtract 36 from 42 to find the remainder, 6.
- Bring down the digit 6 and continue by dividing 66 by 12.
- $66 \div 12 = 5r6$

## Examples of deeper understanding

*Think about the number 34 567 800.*

*Say this number aloud.*

*Round this number to the nearest million.*

*What does the digit '8' represent?*

*What does the digit '7' represent?*

*Divide this number by 100 and say your answer aloud.*

*Divide this number by 1000 and say your answer aloud.*

Place

Value

*Choose digits to go in the empty boxes to make these number sentences true.*

$$14\,781 - 6\boxed{\phantom{0}}53 = 8528$$

$$23 \cdot 12 + 22 \cdot \boxed{\phantom{0}} = 45 \cdot 23$$

Addition and  
Subtraction

Multiplication and  
Division

*Work out:*

$$8 \cdot 4 \times 3 + 8 \cdot 4 \times 7$$

$$6 \cdot 7 \times 5 - 0 \cdot 67 \times 50$$

$$93 \times 0 \cdot 2 + 0 \cdot 8 \times 93$$

$$7 \cdot 2 \times 4 + 3 \cdot 6 \times 8$$



# Maths vocabulary for parents



The aim of this section is to explain some of the maths vocabulary and terms that we use when teaching maths so you can confidently support your child at home.

If there are any further words or phrases you are unsure of then please do not hesitate to ask your child's class teacher, the maths subject leader (Mr Savage) or look here:

<http://www.mathsisfun.com/definitions/index.html>

The definitions have been spilt into the different areas of maths.

### **Number and Place Value**

**Place value** - where the number is in the number system or the value of the digit.

**Digit** means a numerical symbol (1 2 3 4 5 6 7 8 9 0) A number is made up of digits. A digit is not a number, they are different.

**Partition** means split the number into the values of each digit e.g. 125 is 100 and 20 and 5.

**Consecutive** means next door numbers without gaps e.g. 14, 15 and 16 are consecutive.

**Ascending** means ordering a set of numbers from smallest to biggest.

**Descending** means ordering a set of numbers from biggest to smallest

**Estimate** means make a sensible guess.

**Mixed number** has a whole number and a fraction, e'g.  $6 \frac{1}{2} =$  six and a half.

### **Number Facts and Calculations**

**Calculate** means work it out.

**Calculation** means using an operation to work out an answer.

**Difference** means subtract.

**Equation** a maths statement where 2 sides are equal e.g.  $2 + 2 = 4$  or  $2 + 2 = 3 + 1$

**Number sentence** is a calculation involving numbers or an equation e.g.  $4 + 6 = 10$  or  $17 - 3 = 14$

**Operation** means add, subtract, multiply or divide. These are the 4 main operations in maths.

**Sum** means add and only add.  $4 \times 6$  is not a sum, it is a calculation or a multiplication.

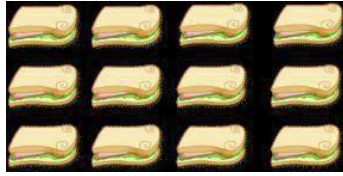


**Multiple** means a number in a particular times table e.g. 50 is a multiple of 10 as it is in your 10 x table.

**Array** is when objects or numbers are arranged in rows and columns.

$$3 \times 4 = 12$$

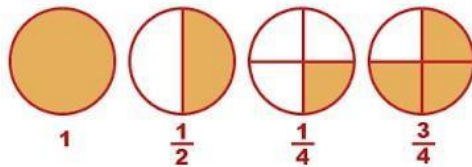
$$4 \times 3 = 12$$



**Inverse** means the opposite. For example, + is the opposite operation to -, x is the opposite of ÷

**Remainder** means the number that is left over if a number does not divide exactly by another eg.  $23 \div 5 = 4 \text{ r}3$  (4 remainder 3).

**Fraction** is part of a number group or objects split into equal parts, e.g. half ( $\frac{1}{2}$ ) of 4 is 2, 3 quarters ( $\frac{3}{4}$ ) of 8 is 6.



## Shape

**Fraction** means part of a whole,  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$  etc. If a whole is split into sixths then the whole will now consist of 6 equally sized pieces.

**Line of symmetry** means the line you would fold down so that the 2 sides would match exactly.

**Vertex**, more commonly known as a corner, means a point where 2 sides or 2 edges meet, (used for 2D and 3D shapes).

**Vertices** - plural of vertex.

**Polygon** means a 2D shape with 3 or more sides.

**Quadrilateral** means a 4-sided shape.

## Measurement

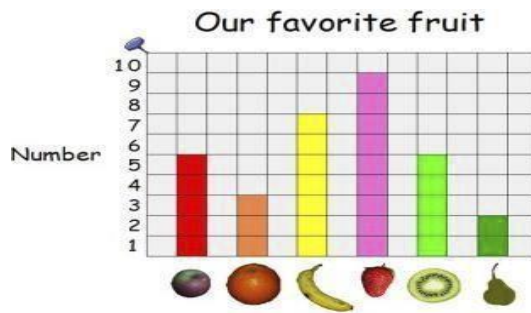
**Analogue clock** shows the 12-hour clock face with a clock face using hands.

**Digital clock** is a clock which doesn't have hands, it shows the time in digits.

**Capacity** means the amount something can hold, usually measured in ml or l.

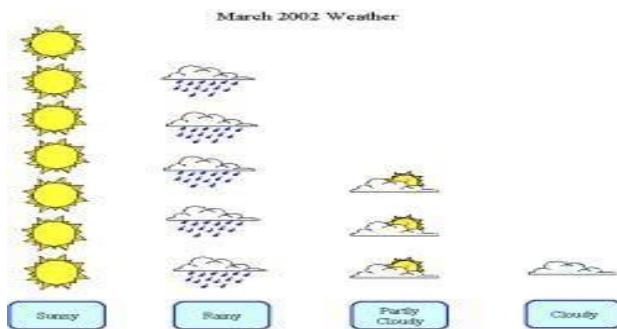
## Handling data

**Block graph** means a simple bar graph made from blocks.

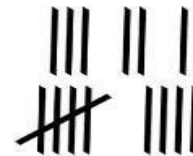


**Pictogram** means a graph where picture represent the data.

For example, if recording eye colour, you could draw coloured eyes to pile up to make a graph. You can also extend the task by one car on the graph representing 2 cars in real life, so half a car on the graph would equal one real car.



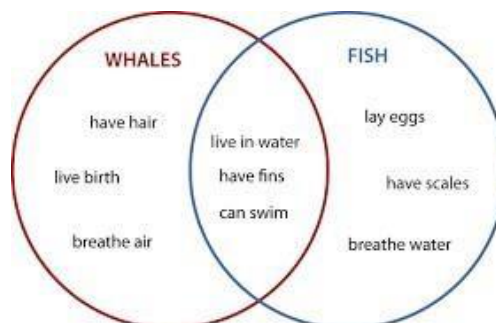
**Tally** means count using a bar and gate.



**Carroll Diagrams** sort data using a yes/no system.

	Triangle	Circle
Blue		
Green		

**Venn Diagrams** sort data using relationships between the set of data being sorted.



## Maths symbols

<b>+</b>	Add Addition Altogether Plus Sum Total
<b>-</b>	Subtract Subtraction Minus Difference Take away How many less/left?
<b>x</b>	Multiply Multiplication Times Times tables Sets of Groups of
<b>÷</b>	Divide Division Share/shared by
<b>=</b>	Equals Equal to
<b>&lt;</b>	Less than
<b>&gt;</b>	Greater than

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