



# Message

February 2018

Dear Parents,

Welcome to our first Maths Message. Occasionally I will send a message to share work taking place in school or to inform you about an upcoming event. The focus of this message is to share with you the schools calculation policy - please see attached.

The four operations - addition, subtraction, multiplication and division are shown and explained on the four calculation cards. These methods progress in proficiency but are not linked to year groups (A is not for Year 3, B for Year 4 etc). Children are introduced to calculation methods when they have demonstrated a secure understanding of place value and are ready to move on. Please don't be tempted to introduce your child to methods before their teacher identifies them as 'ready', as this could lead to confusion. If you have any questions please discuss these with your child's class teacher.

Our children are fantastic at using the correct terminology to explain their thinking and the vocabulary we use supports children's understanding. Please visit the school website, where you will find a copy of the school's calculation policy and links to videos of children explaining the various calculation methods.

*Exciting!* In conjunction with Mr Robinson, our Computing Coordinator, we are launching our very own school YouTube channel. This is where you can find videos of the various calculation methods; being explained by children. These videos are designed to help you support your children and demonstrate the vocabulary we use in school. The videos can also be used by your children to help them remember the methods they have been practising in class.

I hope you find these helpful. If you feel you would like to attend a calculations evening where these methods can be explained in more detail please indicate your interest by returning the slip below to your child's class teacher. Arrangements will be made according to the level of interest, details of any upcoming evenings will be communicated with you in good time.

Thank you for reading and happy calculating!

MISS BARTON

Maths Coordinator



Name of child: \_\_\_\_\_

Class: \_\_\_\_\_

I am interested in a calculation evening.

Signed: \_\_\_\_\_



## Ibstock Junior School Calculation Policy



### Aims of the policy

- To ensure consistency and progression in our approach to calculation
- To ensure that children develop an efficient, reliable, written method of calculation for all operations
- To ensure that children can use these methods accurately with confidence and understanding

We need the calculation policy to fit together and to build upon previous learning. These calculation cards are not based on the year group children are working in and are not meant to be raced through. We want children to fully understand each **operation** on a card before they move on to another one, this progression will be decided by the child's teacher.

Mental methods are always referring to the **place value** of numbers. The more traditional methods looked at speed, because there were no calculators, computers or spreadsheets. Consequently, these 'compact methods' tended to refer to the **digits** and it became possible to tackle calculations as a series of digits rather than thinking of them as a number.

This is not a problem when the child you are working with has a good understanding of PLACE VALUE and REALISES that using digits is a short cut. However, when they are learning these compact methods they need to be able to see the link to the REAL number if they are to be good mathematicians.

If we don't help the children see these links, then they will not understand what they are doing and then mathematics just becomes a series of tricks.

When we introduce a new method in class it will build on what the children know and will link to the previous method they have learnt. This will reinforce the place value of the digits involved. We will sometimes teach one method alongside another to show these links. It would really help the children if all of us could remember to explain these links when assisting a child with their learning.

**Operation:**  $+$   $-$   $\div$   $\times$

**Digit:** a number is made from digits like a word is made from letters e.g. 147 (one hundred and forty seven) is made from the digits one, four and seven

**Place value:** the value a digit represents in a number e.g. 765 (seven hundred and sixty five) the '7' is 'seven hundreds', the '6' is '6 tens or sixty', the '5' is 5 'units' or 5 '1s'





## Addition

(Partitioning Method)

$$49 + 27$$

**Partition** (split into tens and units/ones)  
the numbers

$$49 = 40 + 9 \text{ (add together the tens)}$$

$$27 = 20 + 7 \text{ (add together the ones)}$$

$$40 + 20 = 60$$

$$9 + 7 = 16$$

Add the tens and the units/ones  
together

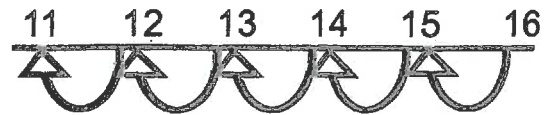
$$60 + 16 = 76$$

$$60 + \underline{10} + 6 = 76$$

## Subtraction

(Finding the difference Method)

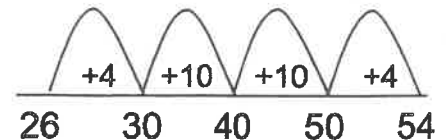
When subtracting below 20, we count backwards.



$$16 - 5 = 11$$

- Draw a number line with a ruler
- Put the smallest number at the start and the biggest number at the end
- Jump to the next ten, then keep jumping in multiples of tens

When subtracting with bigger numbers we count on — we call this **finding the difference**



# A

## Multiplication

(Repeated Addition Method)

Make or draw an  
array

Count them all

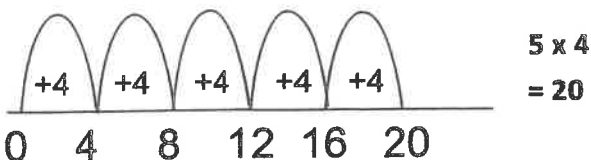
$$4 \times 5 = \underline{20}$$



4, times 5

Write a repeated addition sentence

$$4 \times 5 = 4 + 4 + 4 + 4 + 4 = 20$$



$$5 \times 4 = 20$$

You can show this as jumps

on a number : 5 jumps of 4



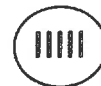
## Division

(Grouping Method)

- Division by grouping

How many groups of 5 can you

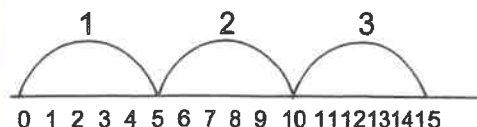
$$\begin{array}{r} \text{dividend} \quad \text{divisor} \quad \text{make?} \\ 15 \div 5 = \underline{3} \end{array}$$



- Then move on to division by jumping in groups of the divisor

$$15 \div 5 = 3$$

- Jump in fives to find how many jumps can be made with your dividend : 15





## Addition

(Expanded Column Method)

- Label the columns and line up the numbers in the correct place value columns
- First add the units/ones, then the tens, then the hundreds digits

$$648 + 138 = \underline{786}$$

HTO

$$\begin{array}{r}
 648 \\
 138 \\
 \hline
 16 \quad (8 + 8) \\
 70 \quad (40 + 30) \\
 700 \quad (600 + 100) \\
 \hline
 786 \quad (\text{Then add the overall total})
 \end{array}$$

(The prompts in brackets can be omitted when children no longer need them)

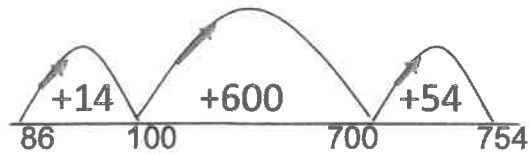


## Subtraction

(Find the difference Method)

- Draw a number line
- Put the smallest number at the start and the **bigger** number at the end
- Count up to **find the difference**
- Make the fewest jumps possible
- Add together the jumps

$$754 - 86 = \underline{668}$$



- Jump to the next ten or hundred, using knowledge of number bonds
- Make sensible jumps

$$\begin{array}{r}
 14 \\
 600 \\
 + 54 \\
 \hline
 8 \\
 60 \\
 600 \\
 \hline
 668
 \end{array}$$

## Multiplication

(Grid Method)

Draw a grid and **partition** the numbers and writing them in the grid

$$124 \times 4 = \underline{496}$$

	(Larger number)			
x	100	20	4	
4	400	80	16	+

$$\begin{array}{r}
 400 \\
 80 \\
 16 \\
 \hline
 90 \\
 400 \\
 \hline
 496
 \end{array}$$

(Multiplier)

$$3.94 \times 4 = \underline{15.76}$$

x	3	0.9	0.04	
4	12	3.6	0.16	+

$$\begin{array}{r}
 12 \\
 3.6 \\
 0.16 \\
 \hline
 0.06 \\
 0.70 \\
 5.00 \\
 10.00 \\
 \hline
 15.76
 \end{array}$$

## Division

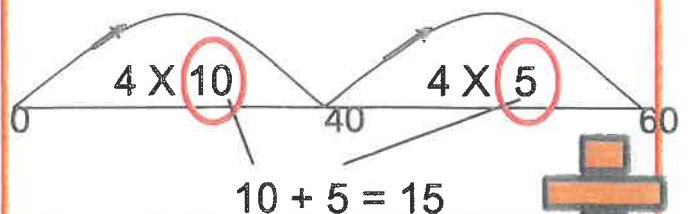
(Grouping on a number line)

$$\text{To solve } 60 \div 4 = 15 \quad (\text{Divisor})$$

Add a Help Box

$4 \times 2 = 8$
$4 \times 5 = 20$
$4 \times 10 = 40$

- Count up in groups of the **divisor** on a number line
- Write the **divisor** first and then how many groups of the **divisor** you've jumped by
- Circle the number of jumps made to find the answer
- Use your tables knowledge to jump along the line in the largest groups possible





## Addition

(Compact Addition)

- Estimate  $4000 + 4000 = 8000$
- Line the digits in place value columns - continue to label if necessary
- Add each column vertically starting from the right (the smallest value)

	Th	H	T	O
	3	6	4	2
+	4	2	5	9
		1	1	
	7	9	0	1

## Subtraction

(Decomposition)

- Estimate  $6000 - 1000 = 5000$
- Line the digits in columns
- Subtract each column vertically starting from the units/ones
- This method may involve exchanging, see video

	Th	H	T	O
	6	<del>4</del>	1	8
-	1	2	2	3
	5	1	9	5

Finding the difference is still useful as a method for  $5003 - 1998 =$

# C

## Multiplication

(Long Multiplication)

- Line the digits in columns
- Always start with the smallest calculation first

	HTU	
Multiplier is	56	
27		
X	27	
	42	(6 x 7)
	350	(50 x 7)
	120	(6 x 20)
	1000	(50 x 20)
	1512	

Once confident the calculations in brackets don't need to be written

## Division

(Short Division/Bus Stop Method)

*Help box*

$8 \times 2 = 16$

$8 \times 5 = 40$

$8 \times 10 = 80$

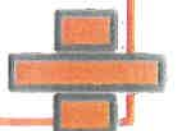
Estimate  $160 \div 8 = 20$

$184 \div 8 = 23$

(Divisor)		2	3
8	1	18	24

Use times tables knowledge and link back to place value

Please see video of method to ensure the correct language is used to support children's understanding





## Addition

- **Estimate**  $133 + 6 + 1 = 140$
- Line the digits in columns
- Add each column vertically starting from the right (the smallest value)

Numbers being exchanged should be placed above answer space so as not to 'forget' these during the calculation.

$$\begin{array}{r}
 132.79 \\
 + \quad 6.20 \\
 + \quad 1.06 \\
 \hline
 140.05
 \end{array}$$

9 hundredths + 6 hundredths = 15 hundredths (1 tenth and 5 hundredths)

Check answer against estimate



## Subtraction

- **Estimate**  $60 - 10 = 50$
- Line the digits in columns
- Subtract each column vertically starting from the right
- If there is 'not enough' **exchange** with the column to the left

	T	O	th	h
	6	<del>3</del> 4	1	1
-	1	2	2	3
	5	1	9	5

Check answer against estimate



## Multiplication

(Short Multiplication)

- **Estimate**  $E=60 \times 30 = 1800$
- Multiply by the bottom number
- Start with the units/ones
- Check answer against estimate

$$\begin{array}{r}
 \quad 56 \\
 \times 27 \\
 \hline
 392 \quad (56 \times 7) \\
 1120 \quad (56 \times 20) \\
 \hline
 1512
 \end{array}$$

The prompts (in brackets) can be omitted if children no longer need them.

## Division

(Long Division)

$$432 \div 15 = 28 \text{ r}12$$

- Write a help box and estimate
- Apply knowledge of digits

		2	8	r12
1	5	4	3	2
		3	0	↓
		1	3	2
		1	2	0
		1	2	

- Don't forget to identify remainders
- Check answer against your estimate

