Year 3 and 4 Mathematics

Parent Workshop 2016-17

Contents

- The new curriculum – what is new in Year 3 and 4.
- 4 operations- including methods used
- Mental Maths
- How you can help at home
- Online support

What's new?

- Focus on various topics each term
- Increased focus on number
- Roman numerals to 100
- Multiplying fractions
- Less focus on 'statistics'
- Larger numbers

High expectations are the key to everything.

Sam Walton

Times tables

By the end of year 4 pupils should:
- Memorise their multiplication tables up to and including the 12 times table
- Show precision and fluency in their work
- Should read and understand mathematical vocabulary correctly and confidently

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

The Four Operations

Addition

add   more   plus   increase   total   sum   altogether

Subtraction

subtract   minus   less   take away   decrease   leave   fewer   difference

Multiplication

multiply   lots of   times   groups of   multiplied by   array   repeated addition   product

Division

divide   remainder   share   share equally   groups of   divided by   repeated subtraction   each

Adding

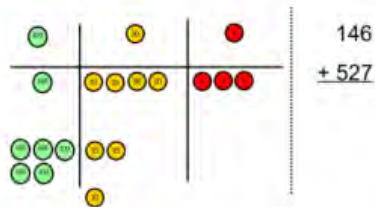| **Adding three single digits**	4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7. Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	 Add together three groups of objects. Draw a picture to recombine the groups to make 10.
Column method- no regrouping	24 + 15= Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters. 	After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions.
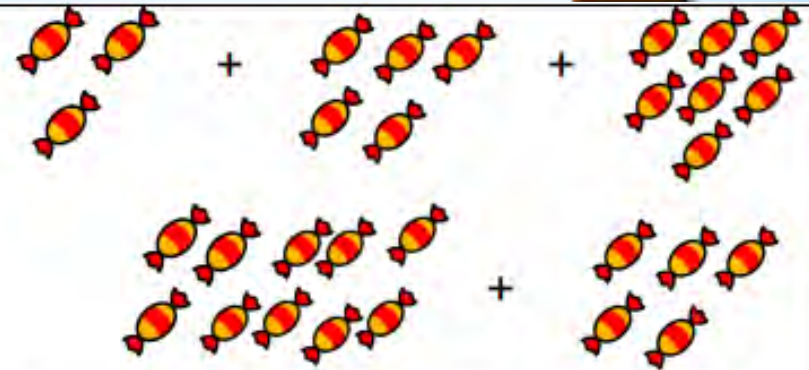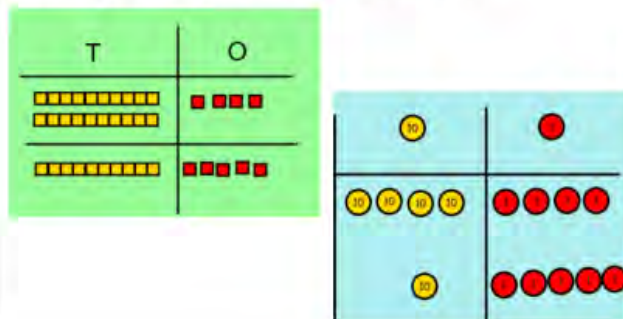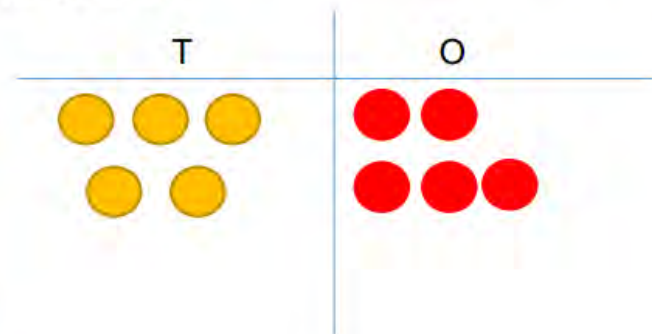
Adding

| Column method- regrouping | Make both numbers on a place value grid. 146 + 527 Add up the units and exchange 10 ones for one 10. 146 + 527 Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added. This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100. As children move on to decimals, money and decimal place value counters can be used to support learning. | Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding. |
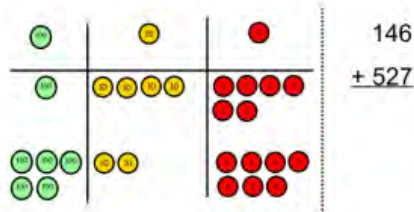
Adding

$12 + 23 =$

+10

+1   +1

23   33   35
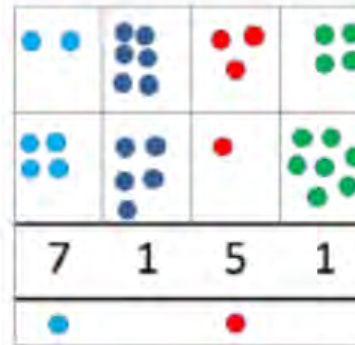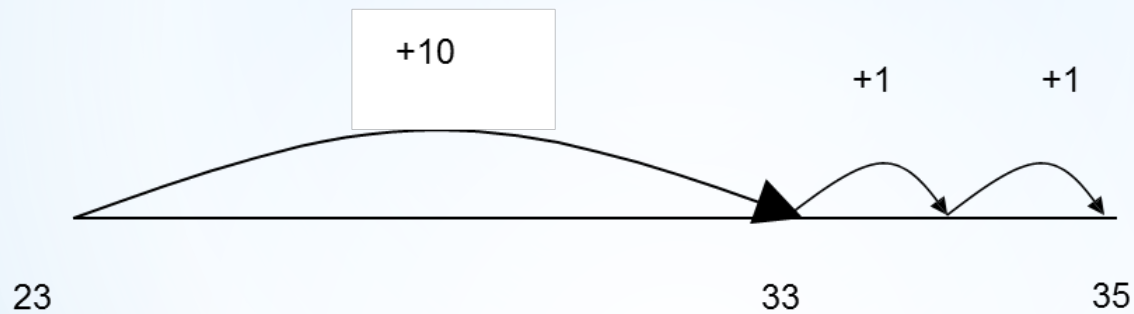
23+ 12   Expanded method
                Partitioning

20 + 10 + 3 + 2 = 30 + 5 = 35

Adding

$$83 + 42 = 125$$

$$\begin{array}{r} 80 + 3 \\ + \ 40 + 2 \\ \hline 120 + 5 \end{array}$$

move to

$$\begin{array}{r} 83 \\ + \ 42 \\ \hline 5 \\ 120 \\ \hline 125 \end{array}$$

Adding

$$358$$
$$+ \quad 73$$
$$\overline{\quad 431}$$
$$\;\;\small 1 \quad 1$$

Carrying over must be done put underneath

So in any class, the same example might be given, but children work it out in different ways, according to their level of understanding.

Adding

Choose a method you are unfamiliar with to solve these sums.

1. 73 + 57
2. 153 + 89
3. 163 + 144
4. 287 + 193

Subtracting

| Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. 13 – 4 Use counters and move them away from the group as you take them away counting backwards as you go.	Count back on a number line or number track 9 10 11 12 13 14 15 Start at the bigger number and count back the smaller number showing the jumps on the number line. -1 -1 -1 -10 -10 34 35 36 37 47 57
Find the difference	Compare amounts and objects to find the difference. Use cubes to build towers or make bars to find the difference 5 Pencils 3 Erasers Use basic bar models with items to find the difference	+6 0 1 2 3 4 5 6 7 8 9 10 11 12 Draw bars to find the difference between 2 numbers. Count on to find the difference. **Comparison Bar Models** Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them. 13 ? Lisa Sister 22
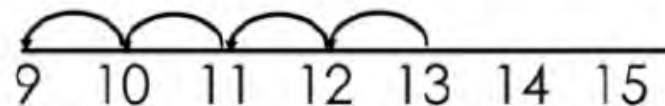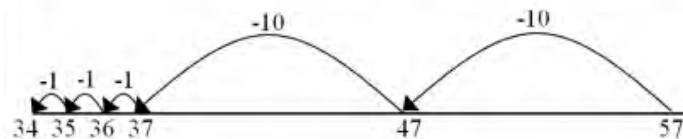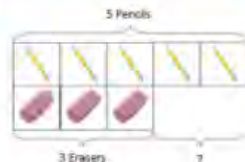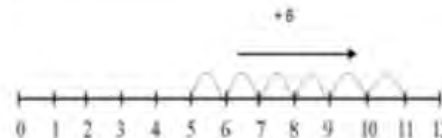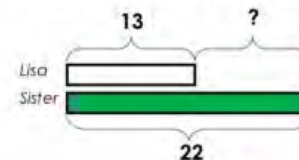
Subtracting

Column method without regrouping
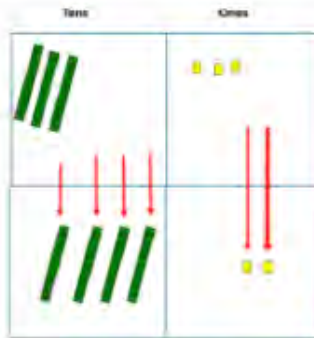
Use Base 10 to make the bigger number then take the smaller number away.

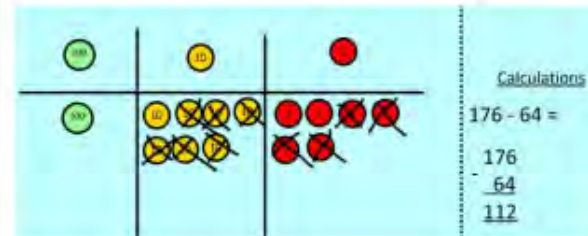Show how you partition numbers to subtract. Again make the larger number first.
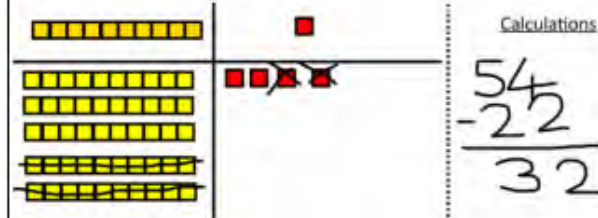
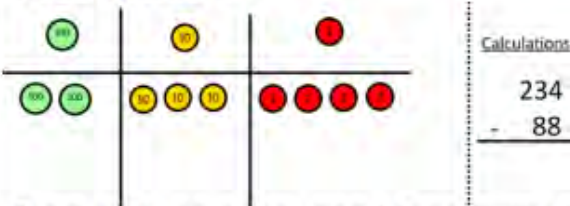Draw the Base 10 or place value counters alongside the written calculation to help to show working.

Subtracting

Column method with regrouping

Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges.

Make the larger number with the place value counters

Calculations

234
- 88

Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.

Calculations

234
- 88

	Hundreds	Tens	Ones
	5/6	12	6
-	2	7	5
	3	5	1
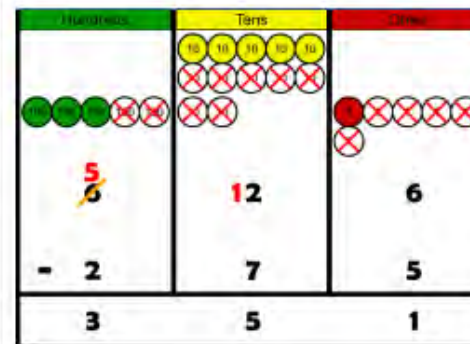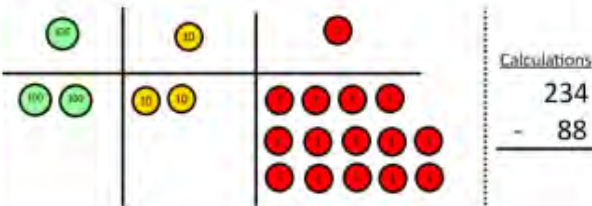
Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.

$42 - 18 = 24$

When confident, children can find their own way to record the exchange/regrouping.

Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.
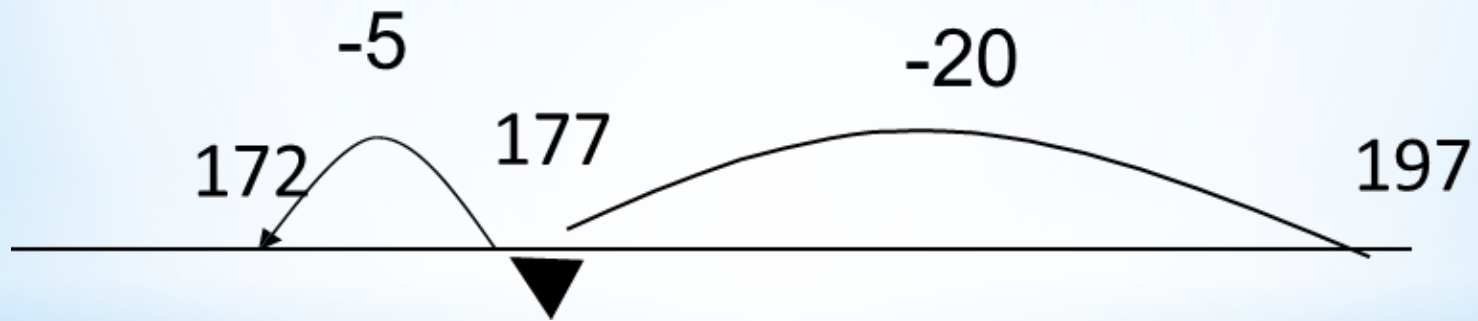
Subtracting

37 − 12

37 − 12 = 37 − 10 − 2
= 27 − 2
= 25

Subtracting

$$197 - 25 = 172$$

-5   -20

172 ⌒ 177   ⌒   197

▼

Subtracting

$$98 - 24 = 74$$

$$\begin{array}{r} 90 + 8 \\ - 20 + 4 \\ \hline 70 + 4 \end{array}$$

Subtracting

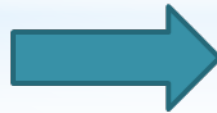$$\overset{8\quad 1}{\cancel{9}\ 2}$$

$$-\underline{3\ 8}$$

$$5\ 4$$

Expanded method

$902 - 38 = 864$

$900 + 0 + 2$

$-\underline{\quad\quad 30\ + 8}$

$\Rightarrow$

$800 + 90 + 12$

$-\underline{\quad\quad 30\ +\ 8}$

$800 + 60 + 4$

Subtracting

Choose a method you are unfamiliar with to solve these calculations.

1. 97 – 42
2. 183 – 55
3. 188 – 54
4. 394 – 131
5. 73 – 29
6. 194 - 38

Multiplying

|			
Repeated addition	$3 + 3 + 3$ Use different objects to add equal groups.	There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there? 2 add 2 add 2 equals 6 $5 + 5 + 5 = 15$	Write addition sentences to describe objects and pictures. $2 + 2 + 2 + 2 + 2 = 10$
Arrays- showing commutative multiplication	Create arrays using counters/ cubes to show multiplication sentences.	Draw arrays in different rotations to find **commutative** multiplication sentences. $4 \times 2 = 8$ $2 \times 4 = 8$ $2 \times 4 = 8$ $4 \times 2 = 8$ Link arrays to area of rectangles.	Use an array to write multiplication sentences and reinforce repeated addition. $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$

Multiplying

Grid Method

Show the link with arrays to first introduce the grid method.

×	10	3

4 rows of 10
4 rows of 3
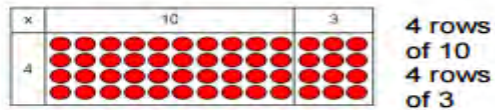
Move on to using Base 10 to move towards a more compact method.

×	T	U

4 rows of 13

Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.

Calculations
4 × 126

Fill each row with 126.

Calculations
4 × 126

Add up each column, starting with the ones making any exchanges needed.

Then you have your answer.

Children can represent the work they have done with place value counters in a way that they understand.

They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.

$$24 \times 3 = 72$$

×	20	4
3	00 00 00 0 0 60	0000 0000 0000 12

$$+ \frac{60}{\frac{12}{72}}$$
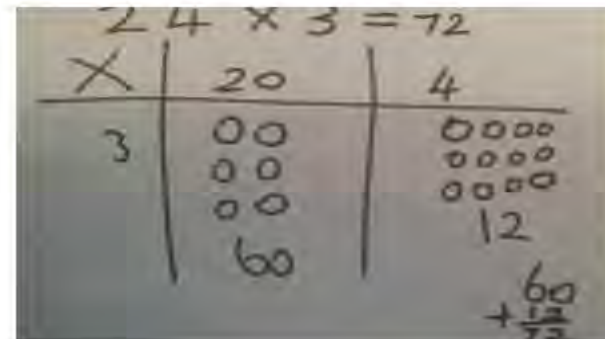
Multiplying

repeated addition:
2 + 2 + 2 + 2

0 1 2 3 4 5 6 7 8
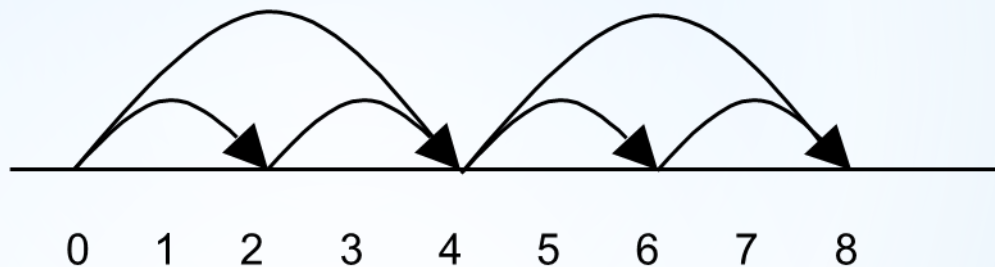
Grid method or partitioning

$35 \times 2 = 70$

x	30	5
2	60	10

60 + 10 = 70

Multiplying

$$23 \times 7 = 161$$

	T	U
x	20	3
7	140	21

$$140 + 21 = 161$$

This method is extended to multiplying a 3 digit number by a single digit

Multiplying

Still use the grid method to multiply numbers up to 3 digits by a single digit.

Move onto more formal method when appropriate: Children could record in brackets – e.g. 15 (3 X 5) Similar to grid method but using vertical recording.

125 x 3

$$
\begin{array}{r}
125X \\
3 \\
\hline
15 \\
60 \\
\underline{300} \\
\underline{375}
\end{array}
$$

$$
\begin{array}{r}
125 \ x \\
3 \\
\hline
\underline{375}
\end{array}
$$

Multiplying

Choose a method you are unfamiliar to solve these calculations.

1. 89 x 5
2. 274 x 8
3. 285 x 4
4. 317 x 7

Dividing

Sharing objects into groups	I have 10 cubes, can you share them equally in 2 groups?	Children use pictures or shapes to share quantities. $8 \div 2 = 4$	Share 9 buns between three people. $9 \div 3 = 3$
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. $96 \div 3 = 32$	Use a number line to show jumps in groups. The number of jumps equals the number of groups. Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group. $20 \div 5 = ?$ $5 \times ? = 20$	$28 \div 7 = 4$ Divide 28 into 7 groups. How many are in each group?
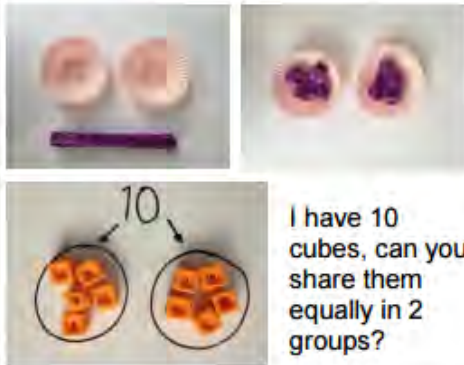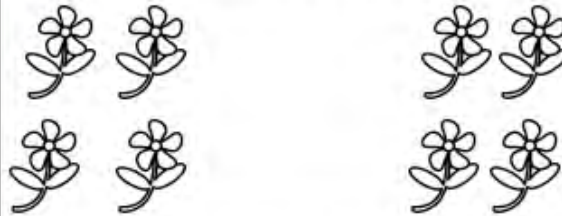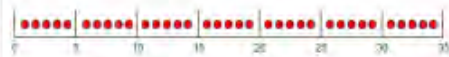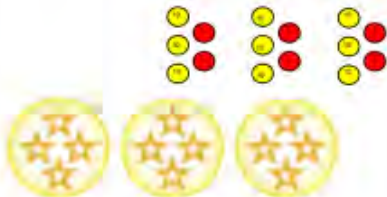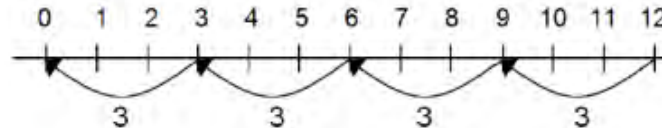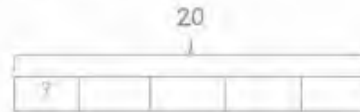
Dividing
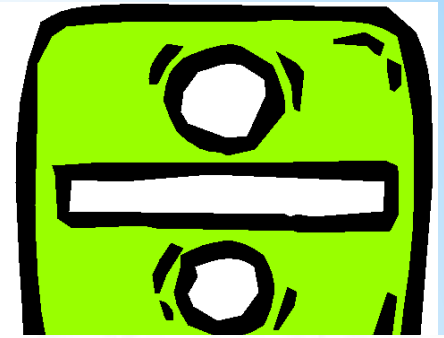
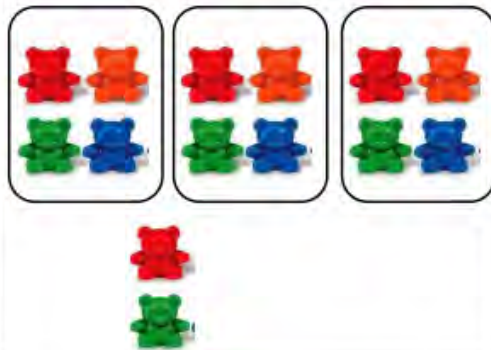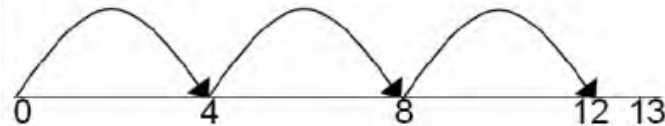| Division within arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$	Draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences. $7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$
Division with a remainder	$14 \div 3 =$ Divide objects between groups and see how much is left over	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder. 0 4 8 12 13 Draw dots and group them to divide an amount and clearly show a remainder. remainder 2	Complete written divisions and show the remainder using r. $29 \div 8 = 3$ REMAINDER 5 dividend divisor quotient remainder
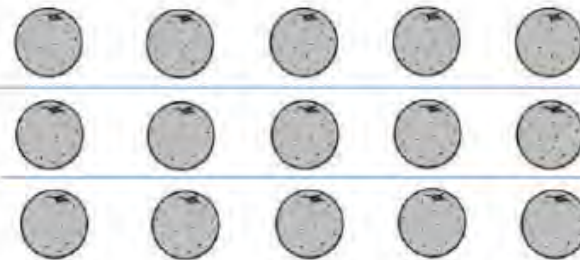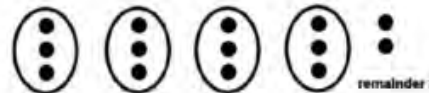
Dividing

Short division
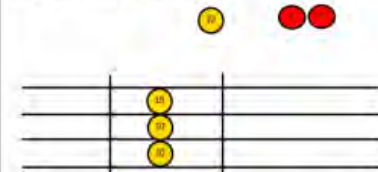
Tens	Units
3	2
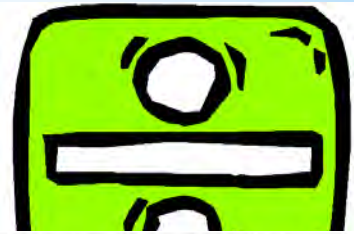
Use place value counters to divide using the bus stop method alongside

Calculations
$42 \div 3$
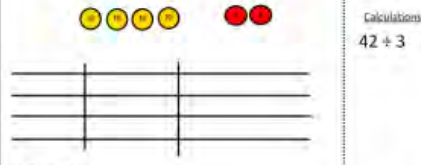
$42 \div 3 =$
Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.
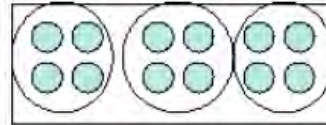

We exchange this ten for ten ones and then share the ones equally among the groups.

We look how much in 1 group so the answer is 14.

Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.

Encourage them to move towards counting in multiples to divide more efficiently.

Begin with divisions that divide equally with no remainder.
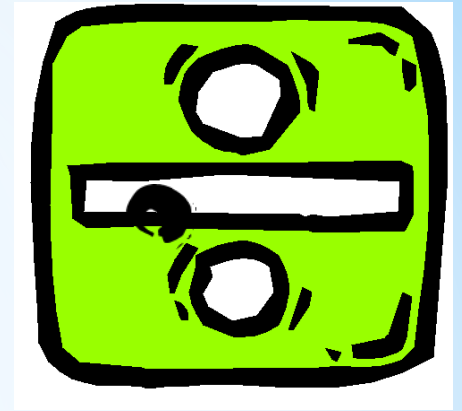
$$\begin{array}{r} 2\ \ 1\ \ 8 \\ \hline 4\ |\ 8\ \ 7\ \ 2 \end{array}$$

Move onto divisions with a remainder.

$$\begin{array}{r} 8\ \ 6\ \ r\ 2 \\ \hline 5\ |\ 4\ \ 3\ \ 2 \end{array}$$

Finally move into decimal places to divide the total accurately.

$$\begin{array}{r} 1\ \ 4\ .\ 6 \\ \hline 3\ 5\ |\ 5\ 1\ 1\ .\ 0 \end{array}$$
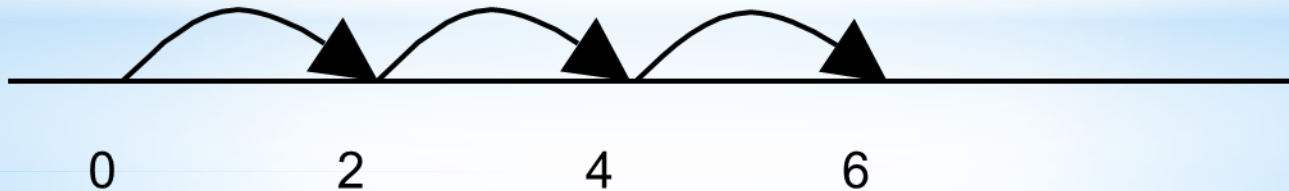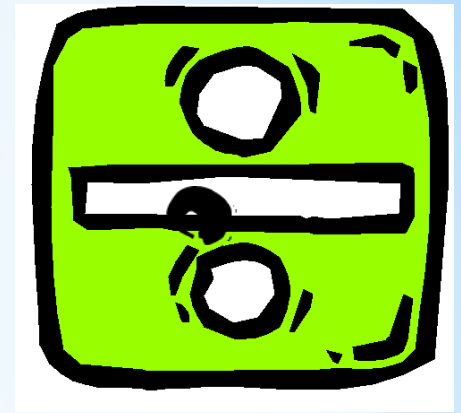
Dividing

$$6 \div 2 = 3$$

Sharing – 6 sweets are shared between 2 people. How many do they have each?

Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?)

Dividing
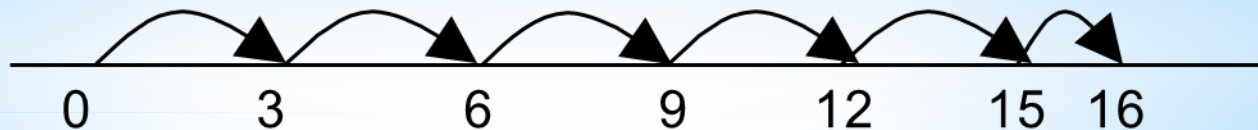
With more advanced numbers, e.g. dividing by 3 or 4
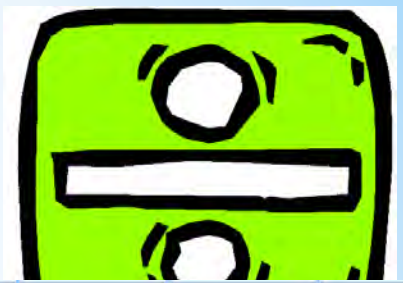
Remainders

$16 \div 3 = 5\ r1$

Sharing - 16 shared between 3, how many left over?

Grouping – How many 3's make 16, how many leftover?

e.g.

Dividing

$$72 \div 3 = 24$$

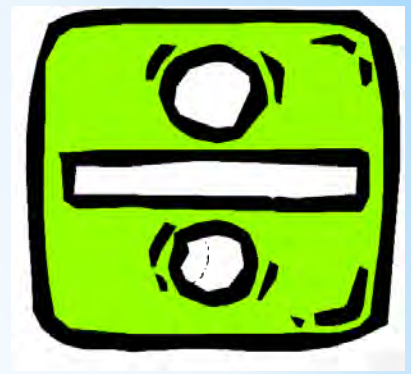$$
\begin{array}{r}
24 \\
3\overline{\smash{)}72} \\
60 \\
\hline
12 \\
12
\end{array}
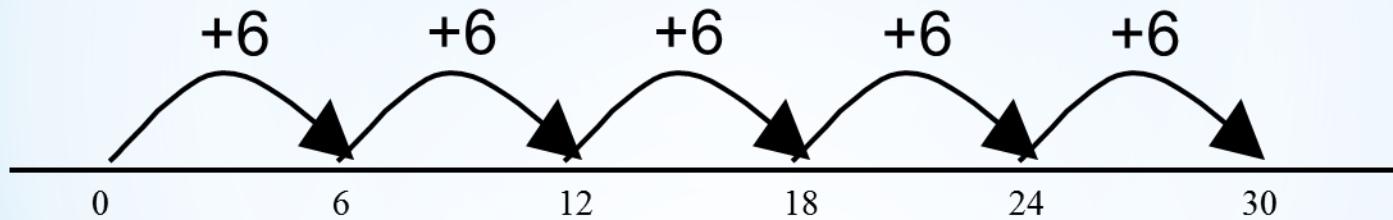$$

$$20 + 4 = 24$$

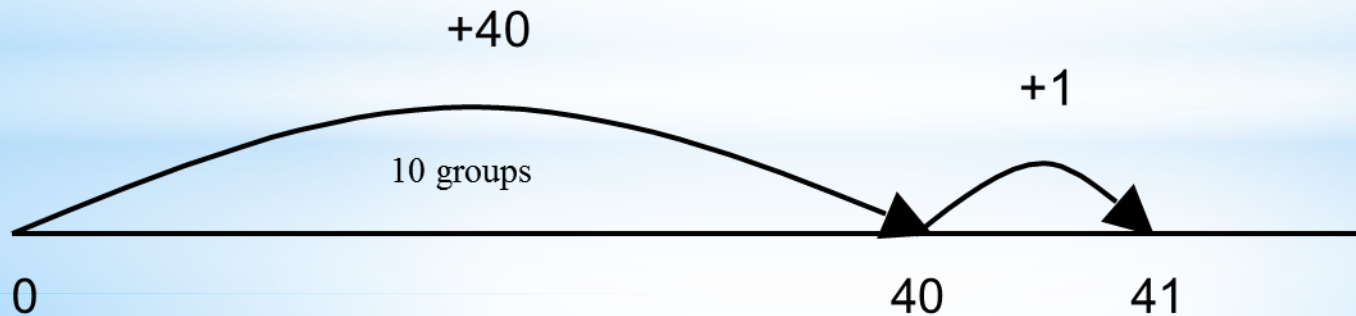$$(20 \times 3)$$
$$+$$
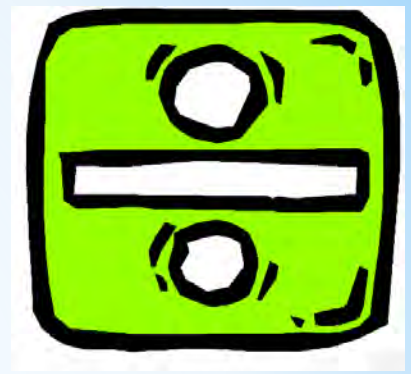$$(4 \times 3)$$

Dividing

$$30 \div 6 = 5$$

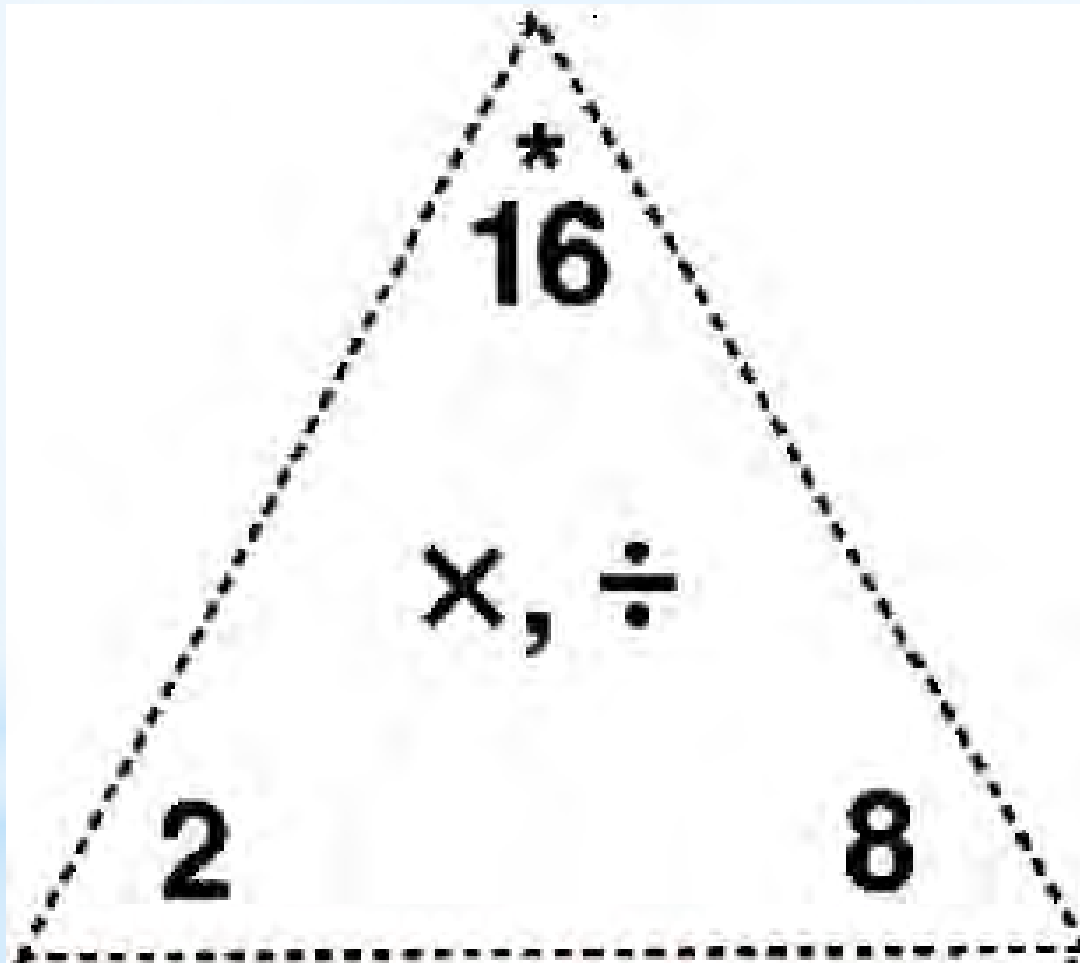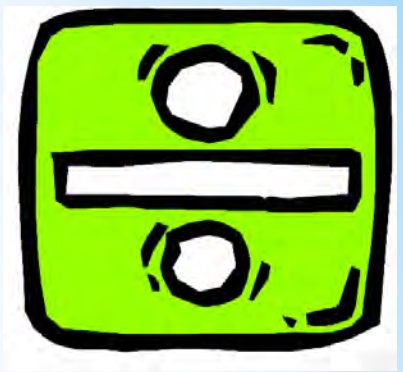$$41 \div 4 = 10 \text{ r } 1 \qquad \text{or} \quad 41 = (10 \times 4) + 1$$

Dividing

Use 'bus stop' method for division:
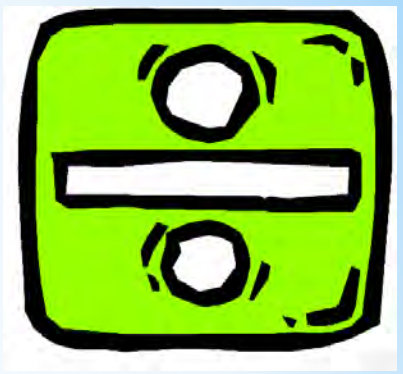Estimate and check.

360 ÷8 is approximately 400 ÷8 = 50

$$\begin{array}{r} 4\,5 \\[-2pt] 8\,\overline{)\,3\,{}^3 6\,{}^4 0\,} \end{array}$$

Dividing

Multiplication and Division Fact Triangle

Dividing

Have a go at these:

35
x ÷
7   5

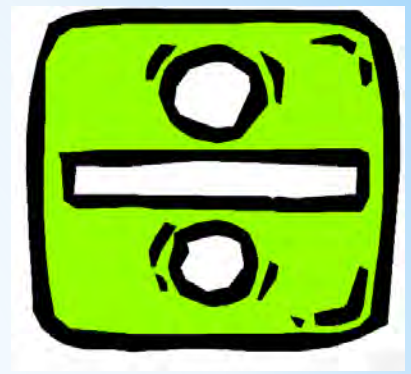45
x ÷
9   5

40
x ÷
8   5

Dividing

Choose a method you are unfamiliar to solve these calculations.

1. $35 \div 5$
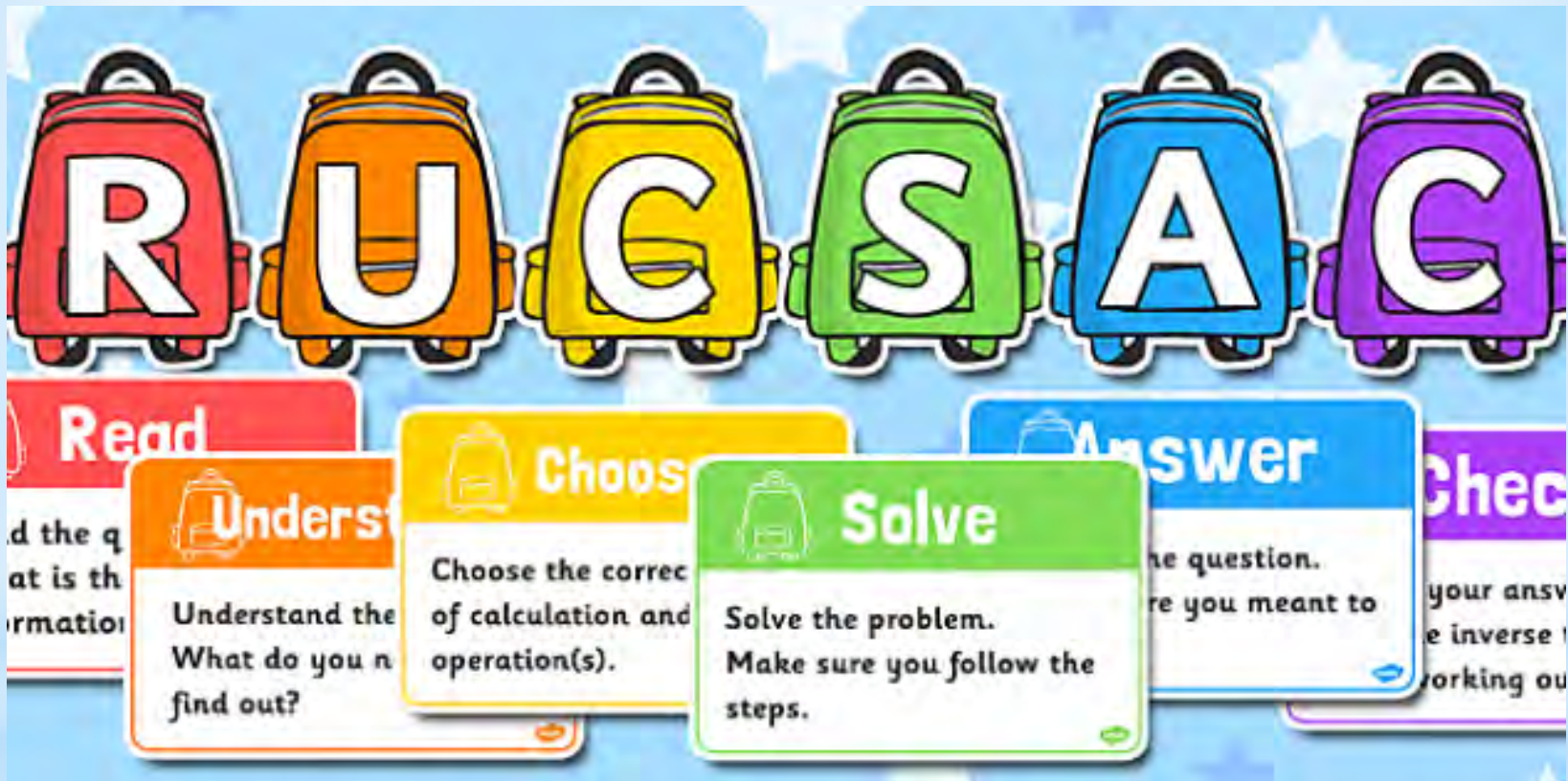
2. $67 \div 8$

3. $270 \div 3$

4. $348 \div 4$

Word Problems

Mental Mathematics

Mental Maths Strategies:

- Use number bonds to 10, 20 and 100
- Use doubles and near doubles
- Counting on and backward in ones, twos, fives, tens
- Partition into tens and units
- Put the biggest number first
- Add 10 then add 1 = adding 11
- Add 10 then subtract 1 = adding 9
- Subtract 10 then subtract 1 = subtracting 11
- Subtract 10 then add 1 = subtracting 9

How can you help at home?

- Lots of practice – in the car, online games, counting stairs, cars, trees etc
-Playing games – cards, snakes and ladders, dominoes
-Cooking
- Telling the time
- Online Applications

Online Applications

MATH PARTY	Multi player mental maths game
MATH BINGO	Math Bingo: Four operation bingo
NUMBERJACKS 3+4	Numberjacks: Addition facts up to 10

(blackboard with + − × ÷)	Four operation practice
Squeebles Times Tables	Squeebles Times Tables 2
(submarine and coin)	Amazing coin: Learn about different British currency