



Subitising



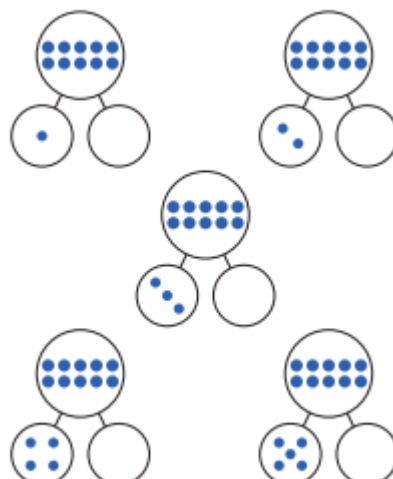
Perceptual Subitising

	0	zero
	1	one
	2	two
	3	three
	4	four
	5	five

Conceptual Subitising

$$\begin{array}{l}
 \text{3 red dots} + \text{5 blue dots} = \text{ } \\
 \text{2 red dots} + \text{5 blue dots} = \text{ } \\
 \text{4 red dots} + \text{1 blue dot} = \text{ } \\
 \text{0 dots} + \text{3 red dots} = \text{8 dots (3 red, 5 blue)}
 \end{array}$$

Composition of 10



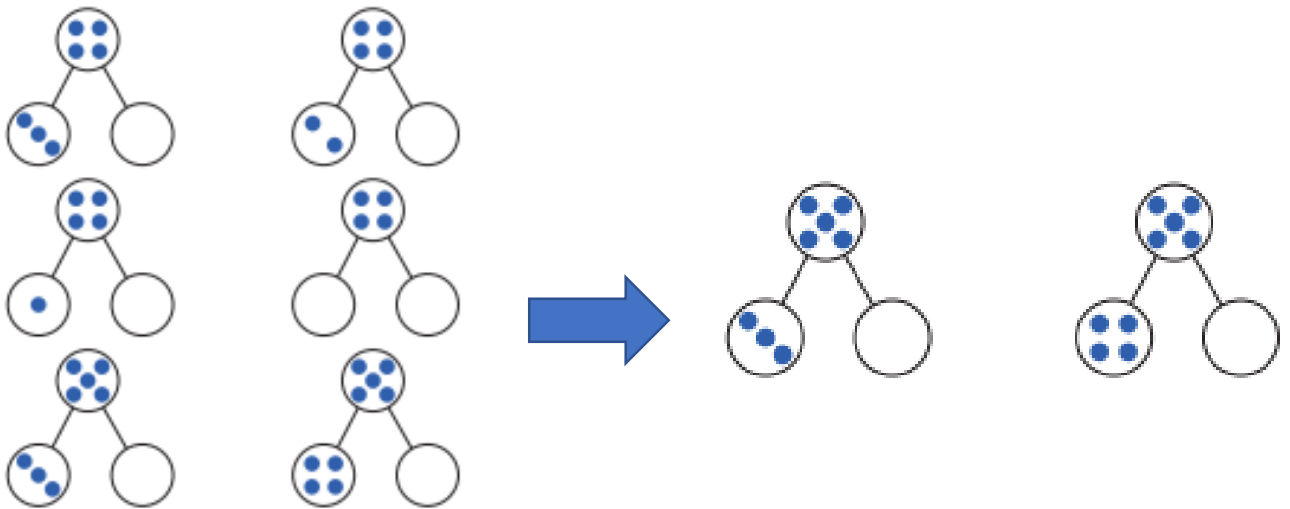


Early Addition



Part-Part-Whole

Composition of 5

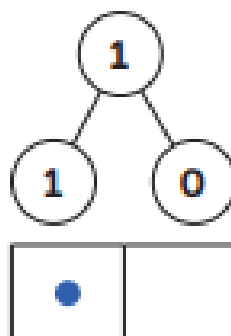


Adding 1. 1 More



2	Double	
3	Double	
4	Double	
5	Double	

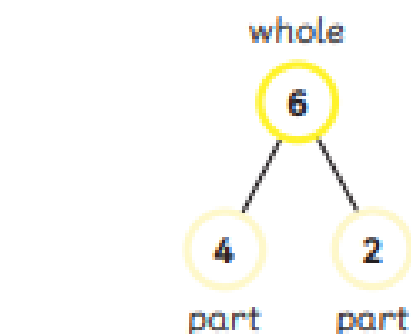
Adding Zero



Year 1 Addition



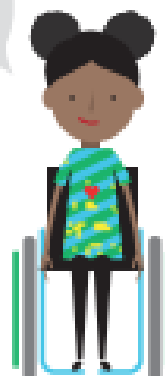
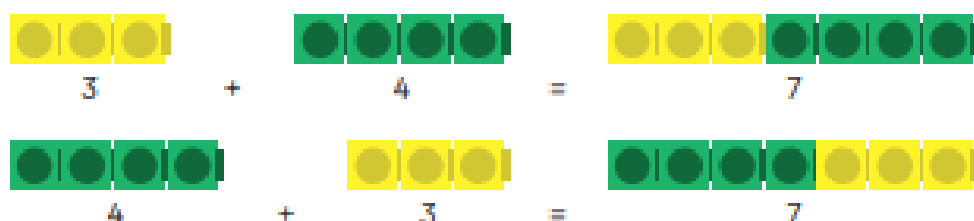
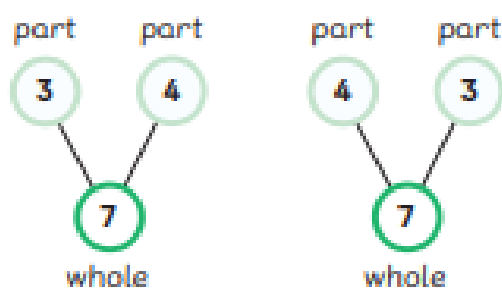
Part-Part-Whole



Number Bonds to 10

+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8		
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7			
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6				
5	5+0	5+1	5+2	5+3	5+4	5+5					
6	6+0	6+1	6+2	6+3	6+4						
7	7+0	7+1	7+2	7+3							
8	8+0	8+1	8+2								
9	9+0	9+1									
10	10+0										

3 plus 4 equals 7.
4 plus 3 equals 7.

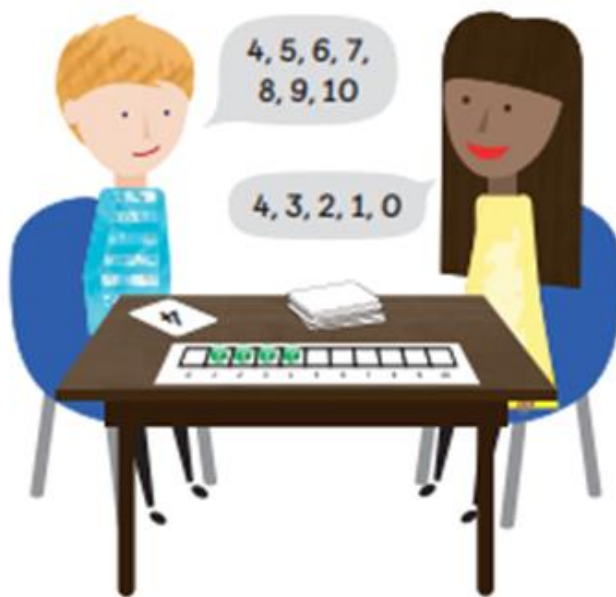




Year 1 Addition

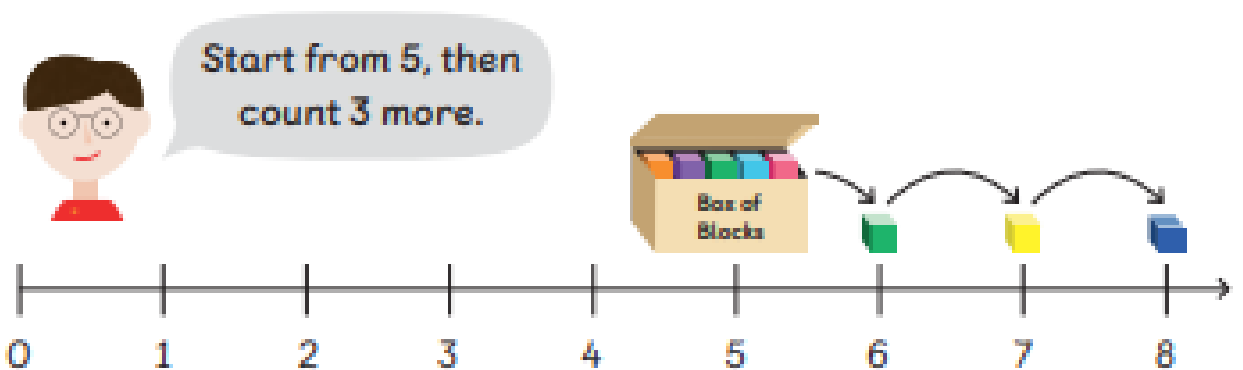


Using a Number Track



Using a Number Line

$$5 + 3 = \square$$





Year 1 Addition



Using Numicon



=



$$3 + 1 = 4$$



=



$$4 = 3 + 1$$



=



$$3 + ? = 4$$

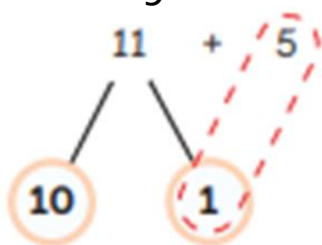


=



$$4 = 1 + ?$$

Adding by making 10



$$10 + 6 = 16$$

$$11 + 5 = 16$$

Emma has
two balls.

Sam has
four balls.

How many
balls in
total?

Addition Word Problems

	+		=	
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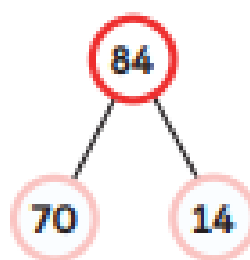


Year 2 Addition

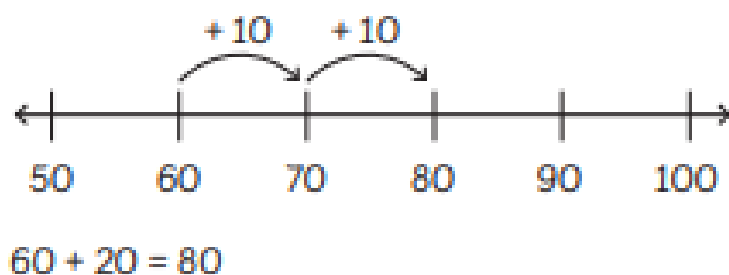


Part-Part-Whole

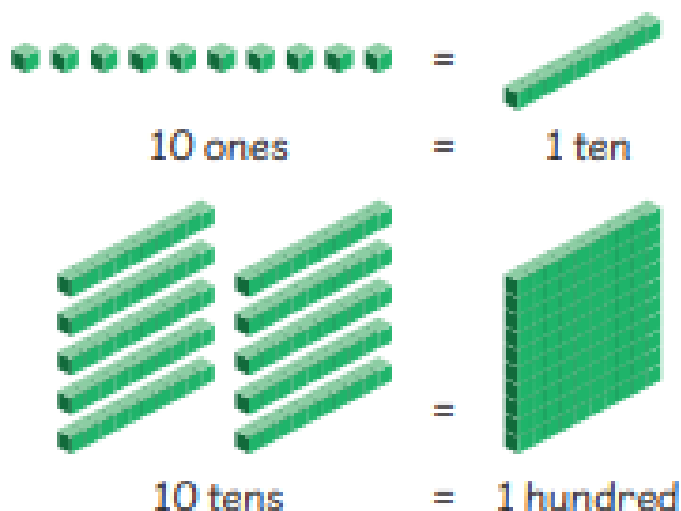
$$84 = 70 + 14$$



Counting on using a Number Line



Base 10



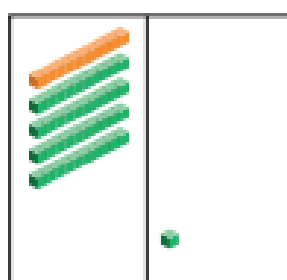
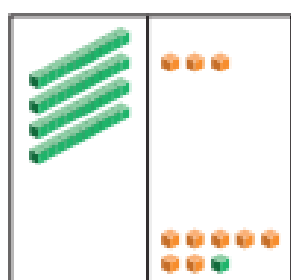
Year 2 Addition



Formal Written Method

$43 + 8 = \square$

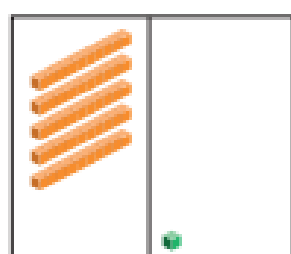
Start by adding the ones.



tens	ones
4	3
+	8
1	1

3 ones + 8 ones = 11 ones
11 ones = 1 ten and 1 one

Rename 10 ones as 1 ten.



tens	ones
4	3
+	8
1	1
+	0
5	1

Then add the tens.



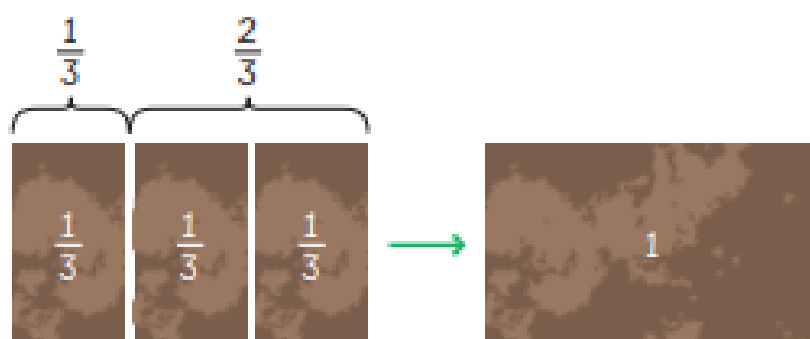
4 tens + 1 ten = 5 tens

$40 + 10 = 50$

$43 + 8 = 51$

There are 51 bottles of water in total.

Adding Fractions

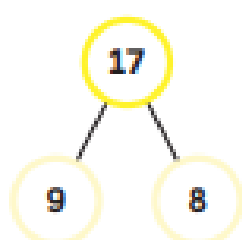


$\frac{1}{3}$ and $\frac{2}{3}$ make 1 whole.

Year 3 Addition



Part-Part-Whole



$$9 + 8 = 17$$

$$8 + 9 = 17$$

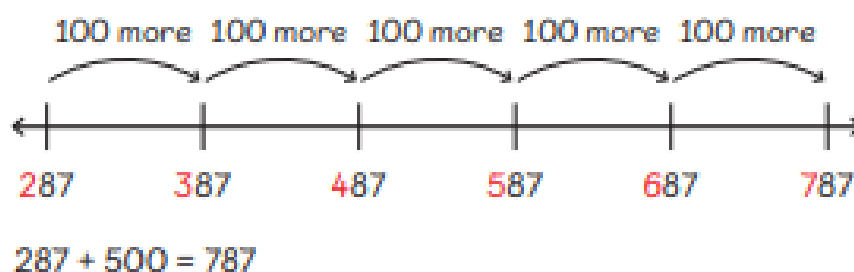
$$17 - 9 = 8$$

$$17 - 8 = 9$$

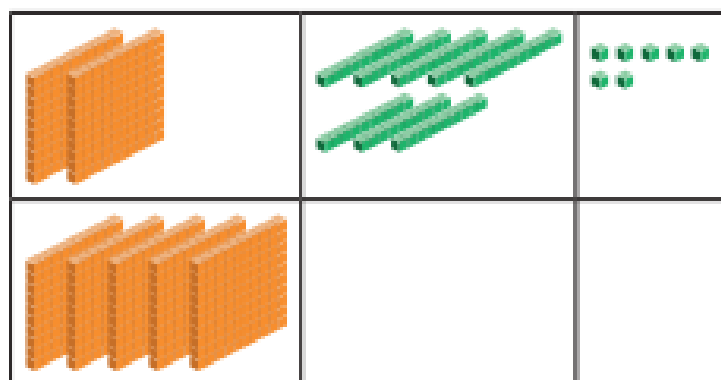


17 is the whole.
8 and 9 are the parts.

Counting on using a Number Line



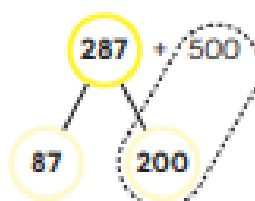
Base 10



	h	t	o
	2	8	7
+	5	0	0
	7	8	7

$$287 + 500 = 787$$

787 fans watched the game in total.



$$200 + 500 = 700$$

$$87 + 700 = 787$$



Year 3 Addition



Formal Written Method

$413 + 582 =$

Step 1 Add the ones.
3 ones + 2 ones = 5 ones

h	t	o
4	1	3
+ 5	8	2
		5

Step 2 Add the tens.
1 ten + 8 tens = 9 tens

h	t	o
4	1	3
+ 5	8	2
		5
		9

Step 3 Add the hundreds.
4 hundreds + 5 hundreds = 9 hundreds

h	t	o
4	1	3
+ 5	8	2
		5
9		9

$413 + 582 = 995$

Adding by Making 100

$$498 + 50 = \text{ }$$

$$498 + 50 = 500 + 48$$

498

+

50

2

=

500 + 48



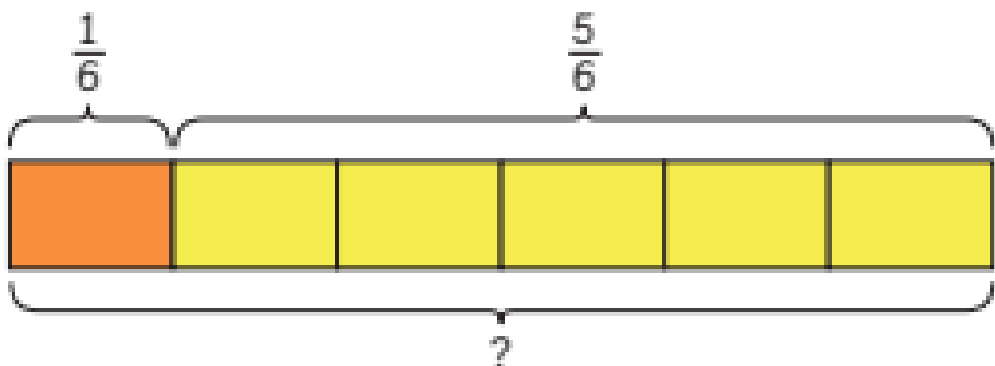
Year 3 Addition



Estimating

 Lulu	 Sam	 Hannah
I had 593 points. 593 is about 600.	I had 695 points. 695 is about 700.	I had 498 points. 498 is about 500.
$600 + 50 = 650$	$700 + 70 = 770$	$500 + 50 = 550$

Adding Fractions



1 sixth and 5 sixths make 6 sixths.

$$\frac{1}{6} + \frac{5}{6} = \frac{6}{6} \\ = 1$$



Year 4 Addition

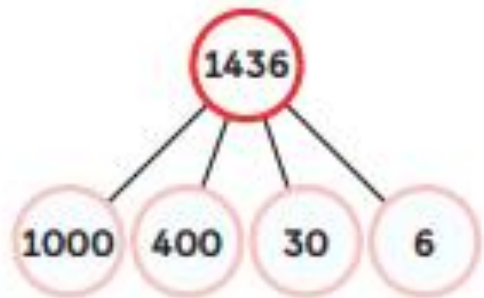


Part-Part-Whole

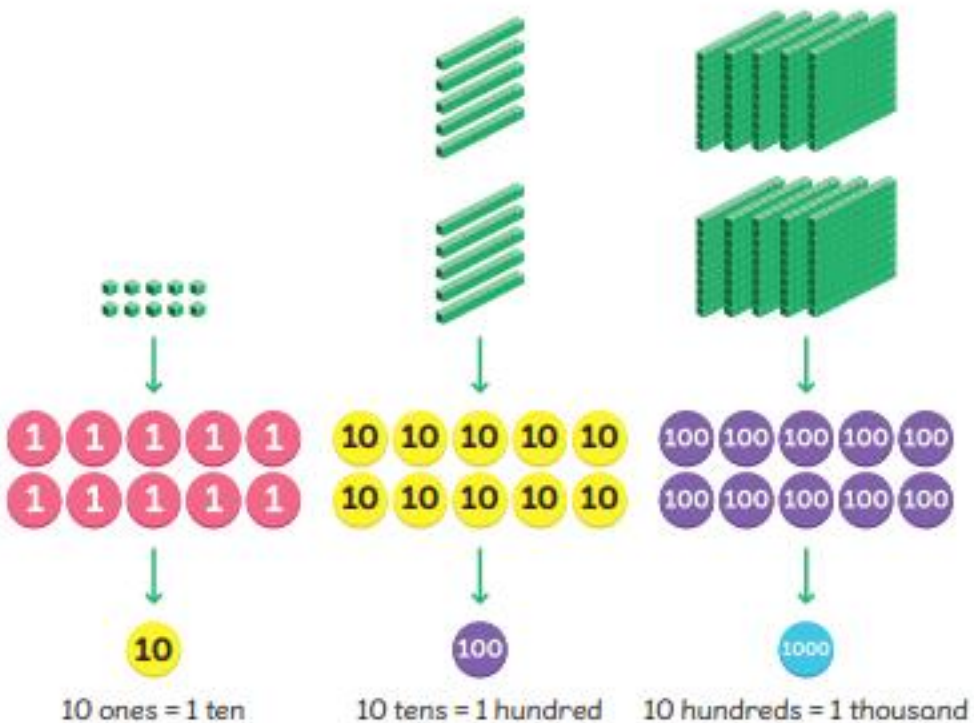


A number can be expressed as a sum of the values of its digits.

$$1436 = 1000 + 400 + 30 + 6$$



Base 10 Blocks





Year 4 Addition



Place Value Counters

$$4506 + 3125 = \boxed{}$$

Step 1 Add the ones.

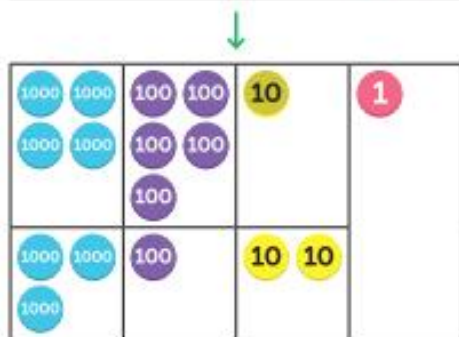
6 ones and 5 ones = 11 ones

Rename the ones.

11 ones = 1 ten and 1 one



$$\begin{array}{r} 4 \quad 5 \quad 0 \quad 6 \\ + 3 \quad 1 \quad 2 \quad 5 \\ \hline 1 \end{array}$$



Formal Written Method

$$4188 + 3245 = \boxed{}$$

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

Add the ones.

Add the tens.

Add the hundreds.

Add the thousands.

$$\begin{array}{r} 2 \quad 6 \quad 1 \quad 2 \\ + 4 \quad 2 \quad 6 \quad 4 \\ \hline 6 \quad 8 \quad 7 \quad 6 \end{array}$$



Year 4 Addition



Estimating the Sum

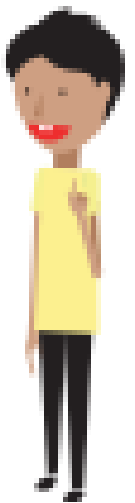
Start by estimating.

$$4188 \approx 4200$$

$$3245 \approx 3200$$

$$4200 + 3200 = 7400$$

The answer will be about 7400.



Making 10 and Making 100

make 10

$$4072 + 8 = \boxed{}$$

$$4072 + 8 = 4070 + 10$$

$$4072 + 8 = 4080$$

make 100

$$97 + 5213 = \boxed{}$$

$$\begin{aligned} 97 + 5213 &= 100 + 5210 \\ &= 5310 \end{aligned}$$



Year 4 Addition

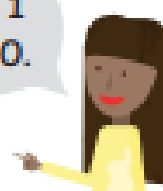


Adding using Compensation

- 1 Lulu used this method to find the sum of 3067 and 9.

$$\begin{array}{l} 3067 + 10 = 3077 \\ 3067 + 9 = 3076 \end{array} \quad \begin{array}{l} \text{1 less} \\ \swarrow \end{array}$$

I know adding 9 is 1 less than adding 10.



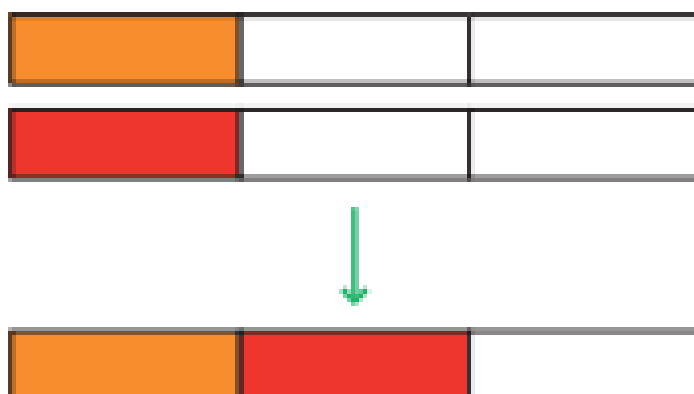
- 2 Ravi used this method to find the sum of 98 and 5262.

$$\begin{array}{l} 100 + 5262 = 5362 \\ 98 + 5262 = 5360 \end{array} \quad \begin{array}{l} \text{2 less} \\ \swarrow \end{array}$$

I know adding 98 is 2 less than adding 100.



Adding Fractions



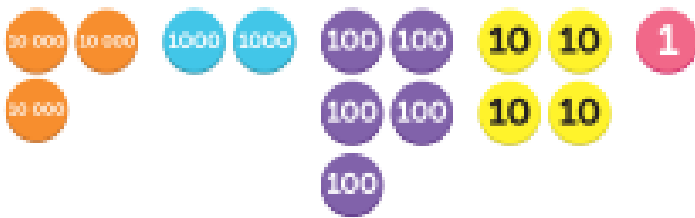
$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

Year 5 Addition

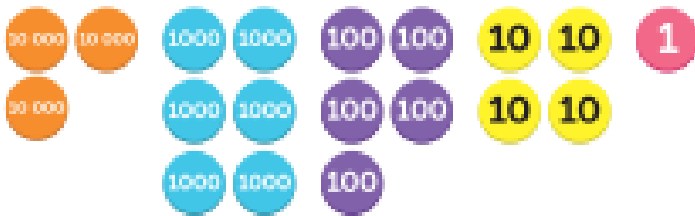


Counting on using Place Value Counters

$$32\,541 + 24\,000 = \text{[]}$$



Count on 4000
in 1000s.

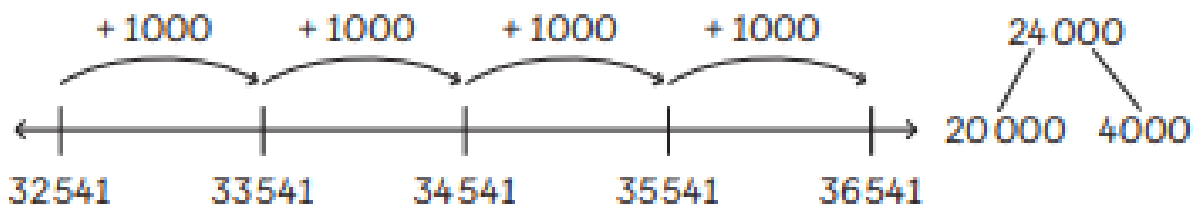


32 541, 33 541,
34 541, 35 541,
36 541

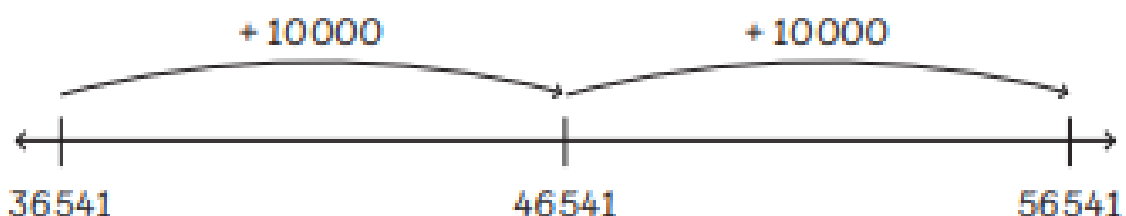


Counting on using Number Lines

Count on 24 000 from 32 541.



$$32\,541 + 4\,000 = 36\,541$$



$$36\,541 + 20\,000 = 56\,541$$

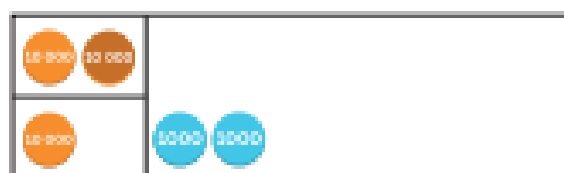
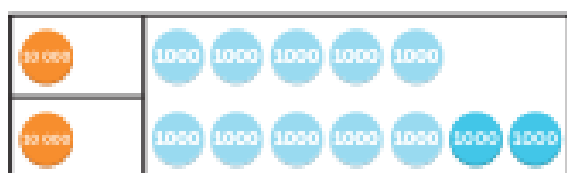
$$32\,541 + 24\,000 = 56\,541$$



Year 5 Addition



Formal Written Method



$$\begin{array}{r}
 1 \\
 15\,000 \\
 + 17\,000 \\
 \hline
 32\,000
 \end{array}$$

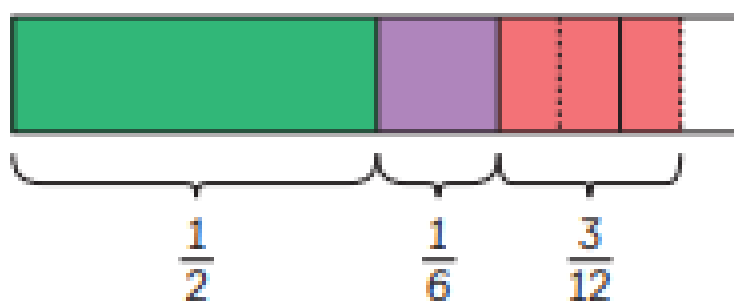
5 thousands + 7 thousands = 12 thousands
 12 thousands = 1 ten thousand + 2 thousands

$$15\,000 + 17\,000 = 32\,000$$



Adding Fractions

Add $\frac{1}{2}$, $\frac{1}{6}$ and $\frac{3}{12}$

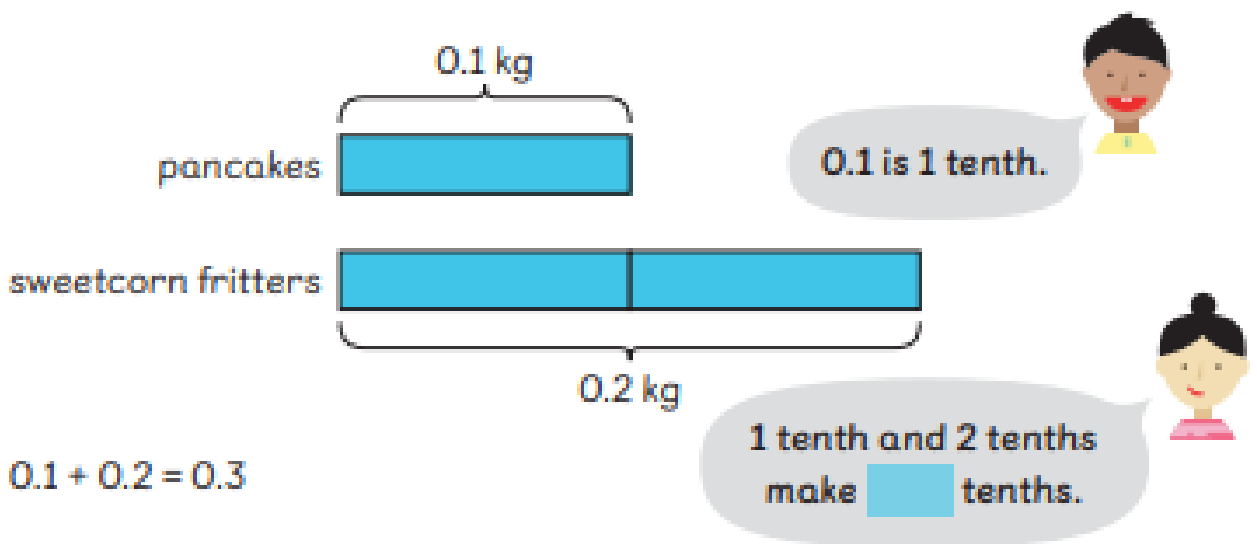


$$\begin{aligned}
 \frac{1}{2} + \frac{1}{6} + \frac{3}{12} &= \frac{6}{12} + \frac{2}{12} + \frac{3}{12} \\
 &= \frac{11}{12}
 \end{aligned}$$

Year 5 Addition



Adding Decimals



Adding Decimals Using the Formal Written Method

$$\begin{array}{r}
 £1.80 \\
 + £0.70 \\
 \hline
 £2.50
 \end{array}$$



Year 6 Addition



Addition within Order of Operations

First, carry out all the operations in ().

Next, perform all the multiplication and division.

Then, calculate all the addition and subtraction.

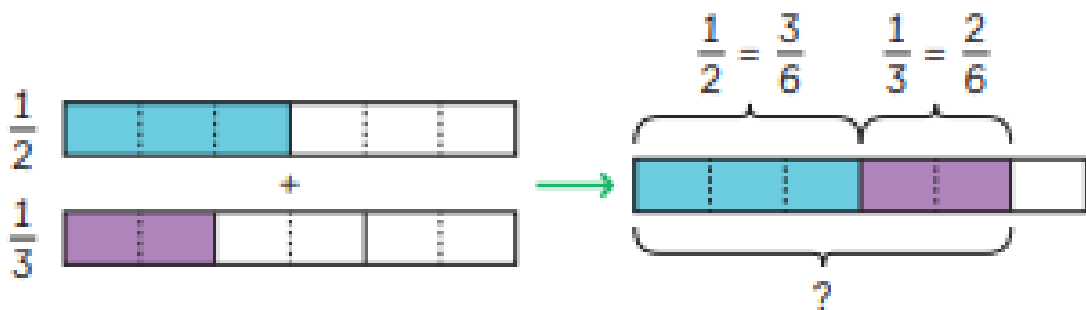
Calculate.

(a) $(1 + 3) \times 5 - 7 =$

(b) $1 + (3 \times 5) - 7 =$

(c) $(1 + 3) \times (7 - 5) =$

Adding Fractions



$$\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$$



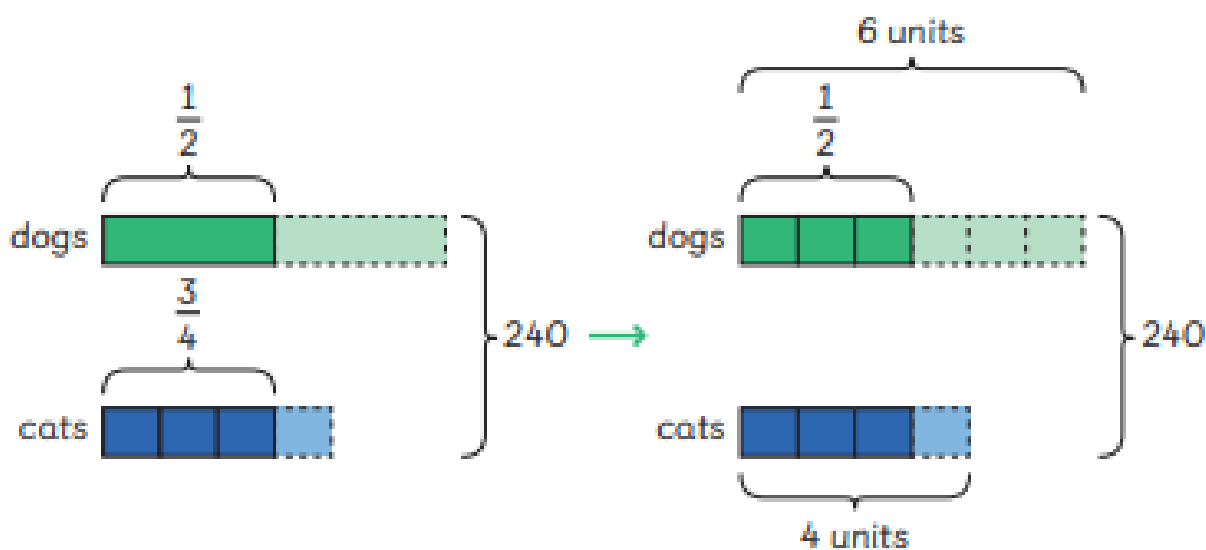
Year 6 Addition



Addition Decimals

$$\begin{array}{r} \text{£ } 3.90 \\ + \text{£ } 2.50 \\ \hline \text{£ } 6.40 \end{array}$$

Bar Models



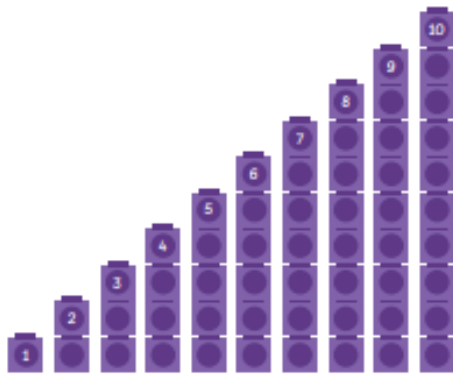
There are $6 + 4$ units altogether.

10 units = 240

1 unit = 24

Reception Subtraction

Subtracting 1
Subtracting 1 Less

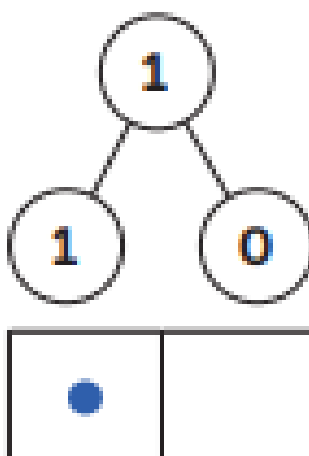


1 more than 3 is . 1 less than 4 is .
 1 more than 5 is . 1 less than 7 is .
 1 more than 9 is . 1 less than 10 is .

Doubles

10	Half	
8	Half	
2	Half	
6	Half	
4	Half	

Subtracting Zero

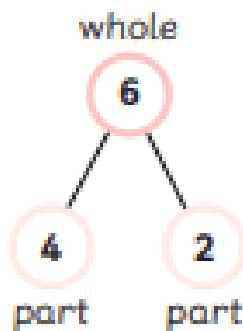


Year 1 Subtraction

Part-Part-Whole



$$6 - 4 = 2$$



There are 6 elephants.

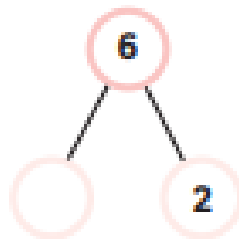
4 elephants are adults.



2 elephants are not adults.

Number Bonds to 10

$$6 - 2 = \square$$



Using a Number Track

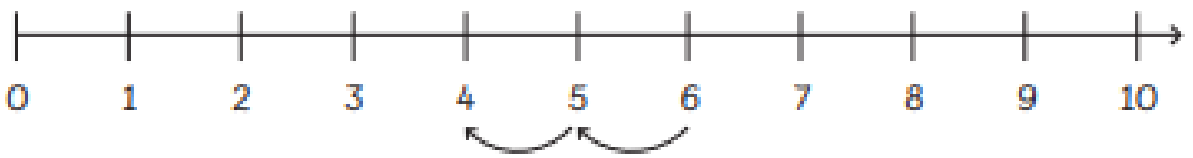


Year 1 Subtraction



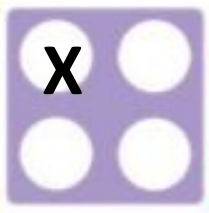
SUBTRACTION

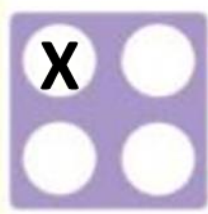
Counting Back Using a Number Line



$$6 - 2 = 4$$

Subtracting using Numicon

whole  =  $4 - 1 = 3$

 =  $3 = 4 - 1$
whole

whole  =  $4 - ? = 3$

 =  $3 = 4 - ?$
whole



Year 1 Subtraction



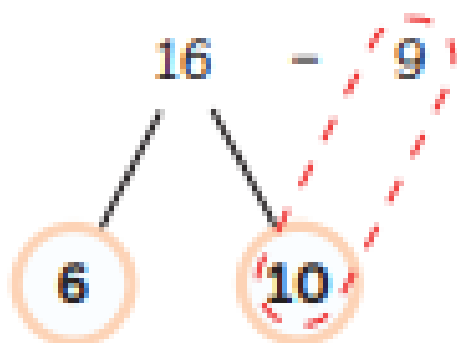
SUBTRACTION

Counting Back Using a Number Line



$$6 - 2 = 4$$

Subtracting from 10



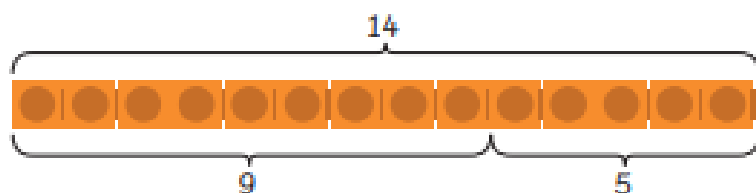
$$10 - 9 = 1$$

$$1 + 6 = 7$$

$$16 - 9 = 7$$

There are 7 logs left.

Subtraction Word Problems



$$\begin{array}{c} 14 - 9 = 5 \\ \swarrow \quad \downarrow \quad \searrow \\ \text{The number of people} \quad \text{The number of people} \quad \text{The number of people} \\ \text{at the bus stop.} \quad \text{who got on the bus.} \quad \text{left at the bus stop.} \end{array}$$

There are 5 people left at the bus stop.

Year 2 Subtraction

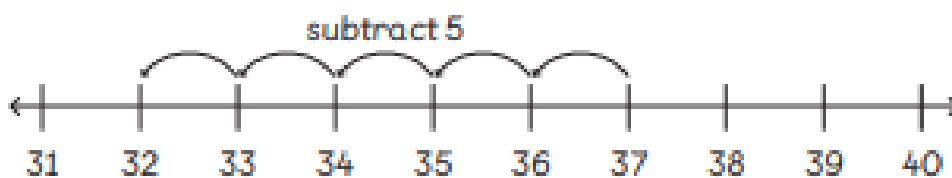
Part-Part- Whole

$$\begin{array}{r} 37 - 5 = 32 \\ \text{30} \quad \text{7} \\ 7 - 5 = 2 \\ 37 - 5 = 32 \end{array}$$

Counting Back Using a Number Line

$$37 - 5 = \square$$

Start counting back from 37.



$$37 - 5 = 32$$



Base 10 Blocks



$$\begin{array}{l} 5 \text{ ones} - 1 \text{ one} = 4 \text{ ones} \\ 5 - 1 = 4 \end{array}$$

Use  to help you.



$$\begin{array}{l} 5 \text{ tens} - 1 \text{ ten} = 4 \text{ tens} \\ 50 - 10 = 40 \end{array}$$

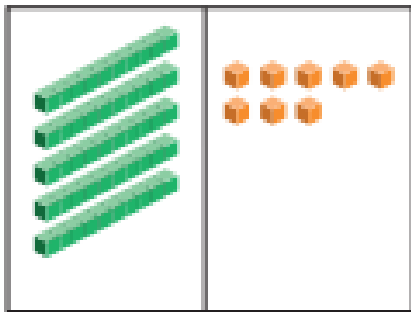
$$5 \text{ tens} = 50$$



Year 2 Subtraction

SUBTRACTION

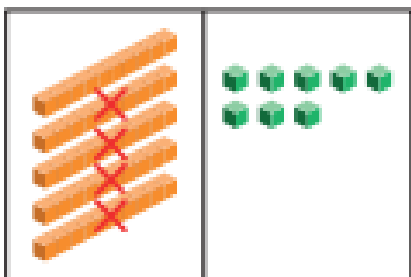
Formal Written Method



$$8 \text{ ones} - 0 \text{ ones} = 8 \text{ ones}$$

$$8 - 0 = 8$$

tens	ones
5	8
- 4	0
	8



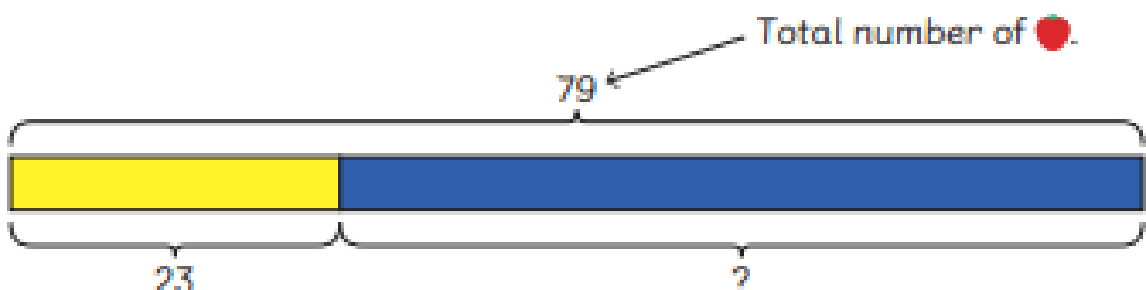
$$5 \text{ tens} - 4 \text{ tens} = 1 \text{ ten}$$

$$50 - 40 = 10$$

$$58 - 40 = 18$$

tens	ones
5	8
- 4	0
1	8

Subtraction Word Problems



Number of strawberries Hannah and Sam ate.

$$79 - 23 = 56$$

There are 56 strawberries left.

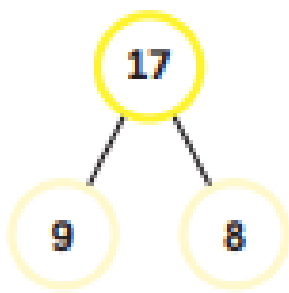
Subtract 23 from 79.



Year 3 Subtraction

SUBTRACTION

Part-Part-Whole



$$9 + 8 = 17$$

$$8 + 9 = 17$$

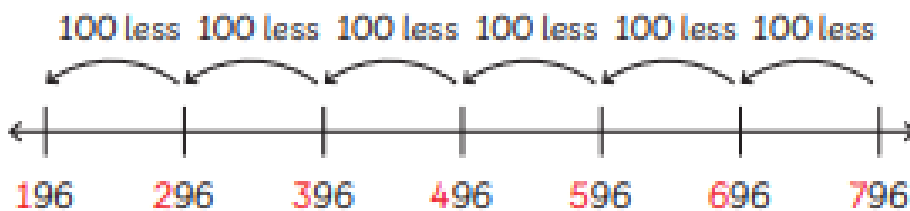
$$17 - 9 = 8$$

$$17 - 8 = 9$$



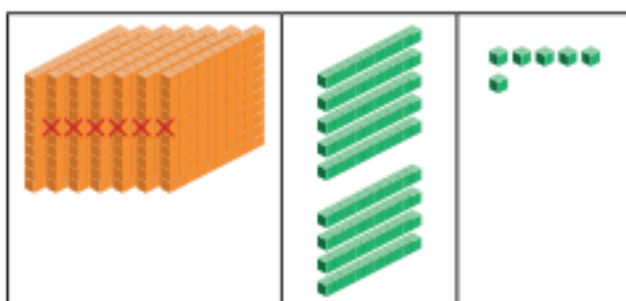
17 is the whole.
8 and 9 are the parts.

Counting Back Using a Number Line



$$796 - 600 = 196$$

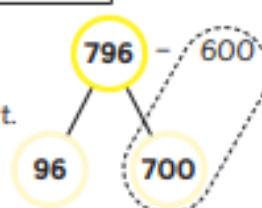
Base 10 Blocks



	h	t	o
	7	9	6
-	6	0	0
	1	9	6

$$796 - 600 = 196$$

There were 196 people left at the airport.



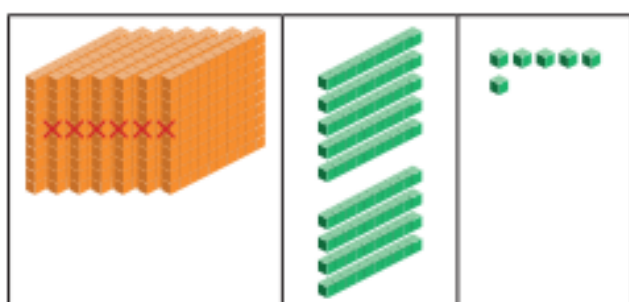
$$700 - 600 = 100$$

$$96 + 100 = 196$$

Year 3 Subtraction

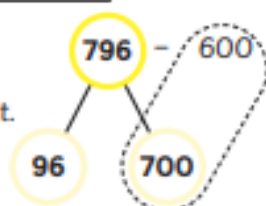
SUBTRACTION

Base 10 Blocks



$$796 - 600 = 196$$

There were 196 people left at the airport.



h	t	o
7	9	6
- 6	0	0
1	9	6

$$700 - 600 = 100$$

$$96 + 100 = 196$$

Formal Written Method

$$507 - 143 = \square$$

Step 1 Subtract the ones.



$$7 \text{ ones} - 3 \text{ ones} = 4 \text{ ones}$$

507		
400	100	7
h	t	o
5	0	7
- 1	4	3
		4

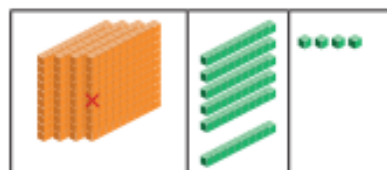
Step 2 Rename 1 hundred as 10 tens.
Subtract the tens.



$$10 \text{ tens} - 4 \text{ tens} = 6 \text{ tens}$$

h	t	o
5 ⁴	0 ¹⁰	7
- 1	4	3
	6	4

Step 3 Subtract the hundreds.



$$4 \text{ hundreds} - 1 \text{ hundred} = 3 \text{ hundreds}$$

$$507 - 143 = 364$$

h	t	o
5 ⁴	0 ¹⁰	7
- 1	4	3
3	6	4

Year 3 Subtraction

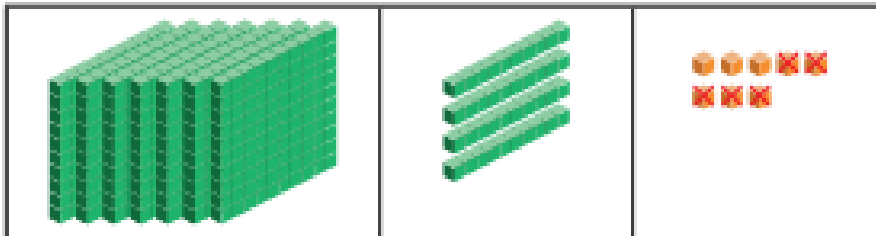
SUBTRACTION

Inverse Operation

$$748 - 425 = \square$$

Step 1 Subtract the ones.

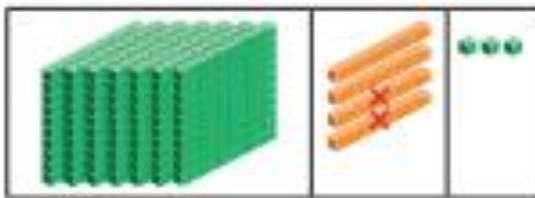
$$8 \text{ ones} - 5 \text{ ones} = 3 \text{ ones}$$



h	t	o
7	4	8
-	4	2
		5
		3

Step 2 Subtract the tens.

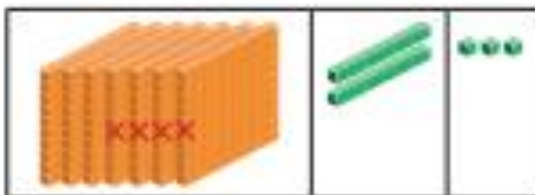
$$4 \text{ tens} - 2 \text{ tens} = 2 \text{ tens}$$



h	t	o
7	4	8
-	4	2
	2	3

Step 3 Subtract the hundreds.

$$7 \text{ hundreds} - 4 \text{ hundreds} = 3 \text{ hundreds}$$



h	t	o
7	4	8
-	4	2
3	2	3

$$748 - 425 = 323$$

323 tomatoes are left.



Check your answer
using addition.
 $323 + 425 = 748$

Year 4 Subtraction

SUBTRACTION

Part-Part-Whole

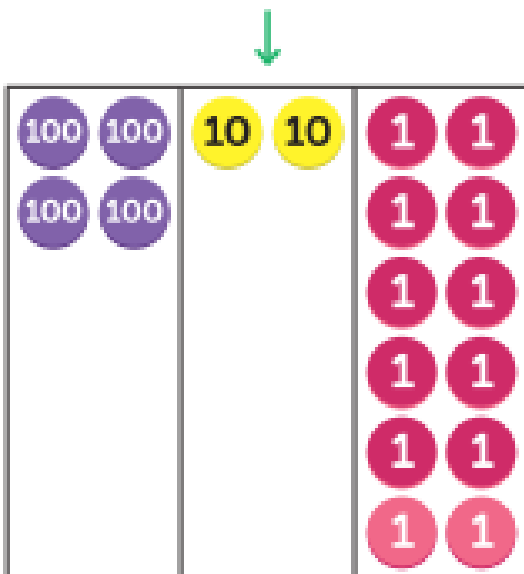
$$\begin{array}{r}
 432 \\
 \swarrow \quad \downarrow \quad \searrow \\
 \begin{array}{r} 400 \\ -100 \\ \hline 300 \end{array} \quad \begin{array}{r} 20 \\ -10 \\ \hline 10 \end{array} \quad \begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}
 \end{array}$$

Place Value Counters

What is the difference between 432 and 119?



There are not enough ones.
Rename 1 ten as 10 ones.

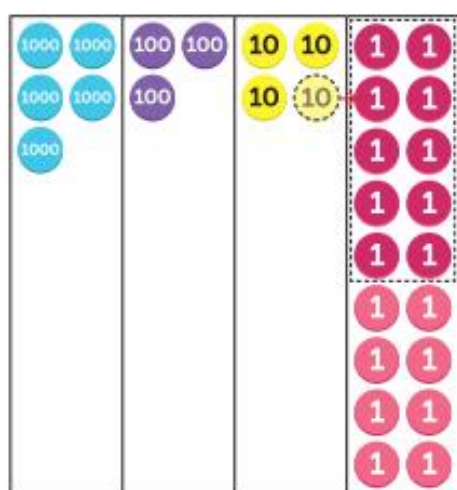


$$\begin{array}{r}
 432 \\
 \swarrow \quad \downarrow \quad \searrow \\
 \begin{array}{r} 400 \\ -100 \\ \hline 300 \end{array} \quad \begin{array}{r} 20 \\ -10 \\ \hline 10 \end{array} \quad \begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}
 \end{array}$$

Year 4 Subtraction

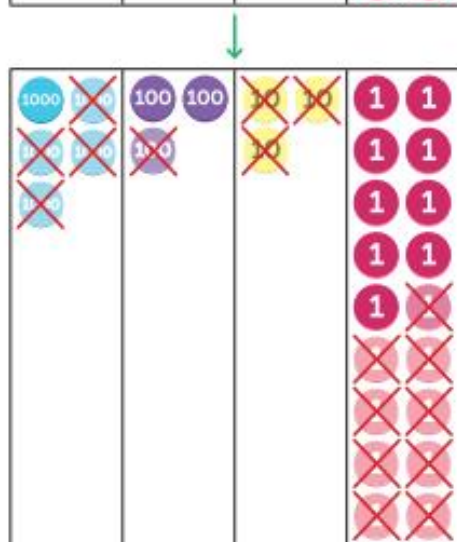
SUBTRACTION

Formal Written Method



Rename 1 ten to 10 ones.

$$\begin{array}{r} 5348 \\ - 4139 \\ \hline \end{array}$$



Now there are enough ones to subtract.

$$\begin{array}{r} 5348 \\ - 4139 \\ \hline 1209 \end{array}$$



Using Addition to Check Subtraction



Step 1 Subtract the ones.
18 ones - 9 ones = 9 ones

Step 2 Subtract the tens.
3 tens - 3 tens = 0 tens

Step 3 Subtract the hundreds.
3 hundreds - 1 hundred = 2 hundreds

Step 4 Subtract the thousands.
5 thousands - 4 thousands = 1 thousand

$$5348 - 4139 = 1209$$

$$\begin{array}{r} 5348 \\ - 4139 \\ \hline 1209 \end{array}$$



Check.

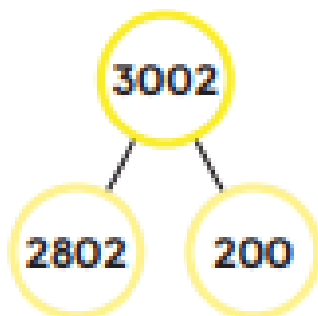
$$\begin{array}{r} 1209 \\ + 4139 \\ \hline 5348 \end{array}$$

Year 4 Subtraction

SUBTRACTION

Mental Methods

$$3002 - 198 = 2804$$

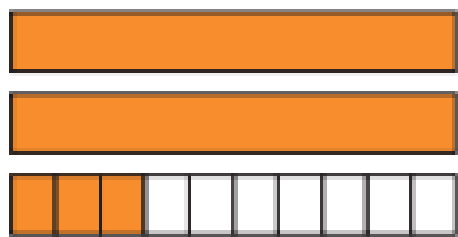
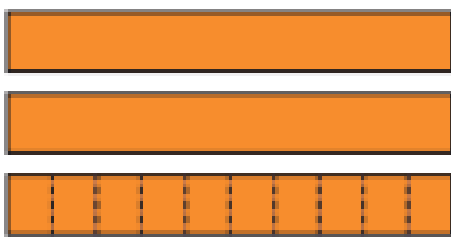


$$3002 - 198 = 2802 + 2$$

$$200 - 198 = 2$$



Subtracting Fractions



$$\begin{array}{l} 3 - \frac{7}{10} = 2\frac{10}{10} - \frac{7}{10} \\ \begin{array}{l} 2 \\ 1 \end{array} = 2\frac{3}{10} \end{array}$$



$$1 = \frac{10}{10}$$

Year 5 Subtraction

SUBTRACTION

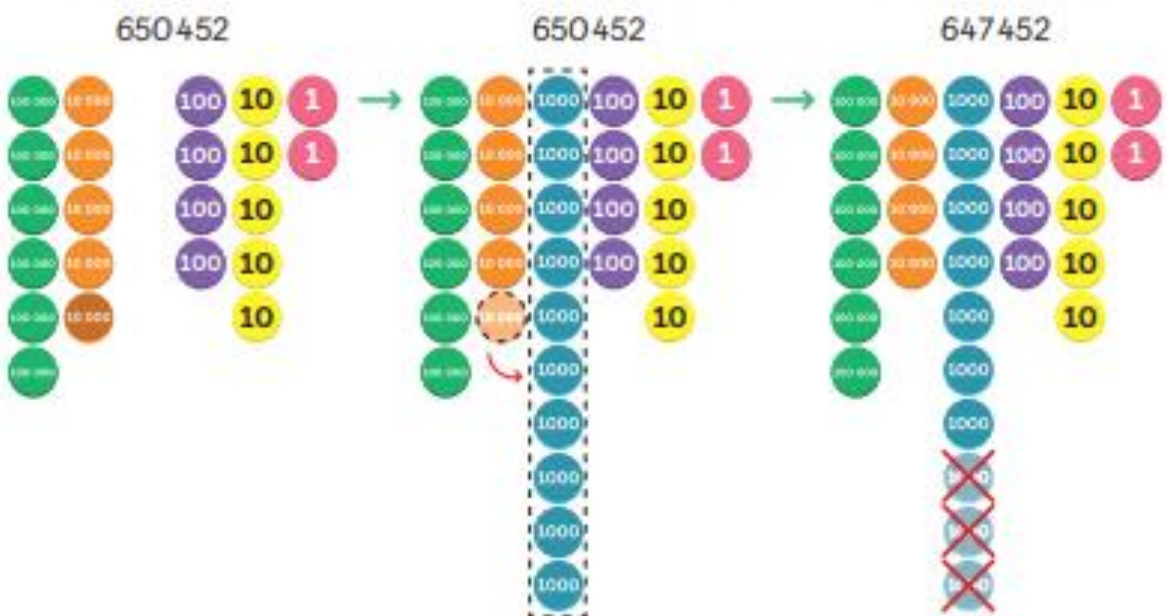
Counting Back Using Place-Value Counters

Subtract 3000 from 650452.
Start at 650452. Count back in 1000s.



How can I count back from 50 000?

You could exchange
10 000 for ten 1000.



$$650452 - 3000 = \boxed{}$$

Counting Back Using Number Lines

Count back 30 000 from 153 672.



$$153672 - 30000 = \boxed{}$$

Year 5 Subtraction

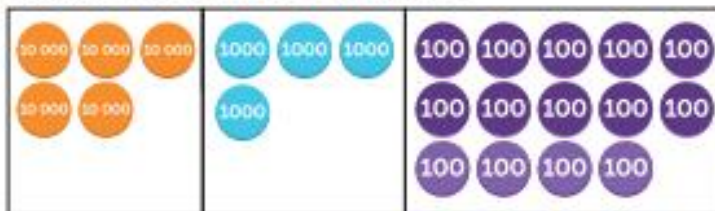
SUBTRACTION

Formal Written Method

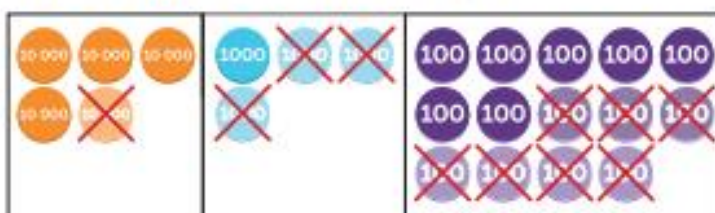
$$55\,400 - 13\,700 = \boxed{}$$



Rename 1 thousand as 10 hundreds.



Subtract 7 hundreds from 14 hundreds.



$$\begin{array}{r} 4 14 \\ 5\cancel{5}\cancel{4}00 \\ - 13700 \\ \hline 1700 \end{array}$$

Subtract the thousands.

$$\begin{array}{r} 4 14 \\ 5\cancel{5}\cancel{4}00 \\ - 13700 \\ \hline 1700 \end{array}$$

Subtract the ten thousands.

$$\begin{array}{r} 4 14 \\ 5\cancel{5}\cancel{4}00 \\ - 13700 \\ \hline 41700 \end{array}$$

Checking by Using Estimation and Addition

$$75\,241 - 34\,658 = 40\,583$$

$$\begin{array}{r} 40\,583 \\ + 34\,658 \\ \hline 75\,241 \end{array}$$

I checked my answer using addition.



$$75\,241 - 34\,658 = 75\,000 - 35\,000 = 40\,000$$

I checked my answer using estimation.





Year 5 Subtraction

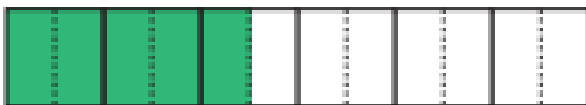
SUBTRACTION

Subtracting Fractions



$$1 - \frac{1}{6} = \frac{6}{6} - \frac{1}{6}$$

$$= \frac{5}{6}$$



$$\frac{5}{6} - \frac{5}{12} = \frac{10}{12} - \frac{5}{12}$$

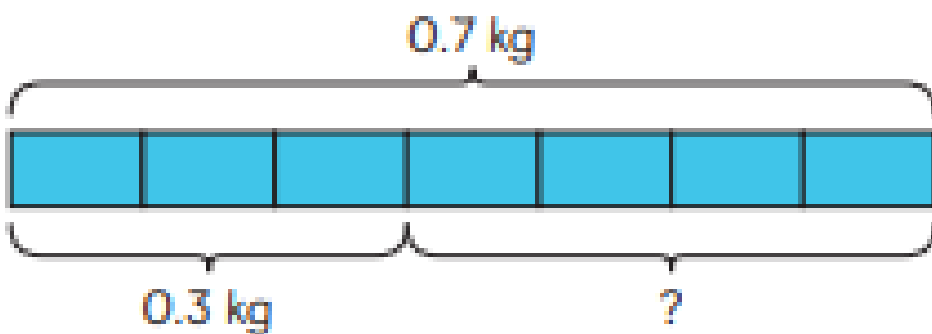
$$= \frac{5}{12}$$

$$\frac{5}{6} = \frac{10}{12}$$



Subtracting Decimals

Find the difference between 0.7 kg and 0.3 kg.



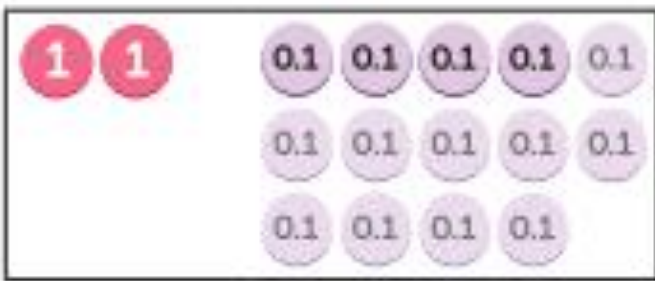
$$0.7 - 0.3 = 0.4$$

Year 5 Subtraction

SUBTRACTION

Subtracting Decimals Using the Formal Written Method

Find the difference between £3.40 and £2.50.



$$\begin{array}{r} \overset{2}{\cancel{£3}}.\overset{14}{\cancel{40}} \\ - £2.50 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{2}{\cancel{£3}}.\overset{14}{\cancel{40}} \\ - £2.50 \\ \hline £0.90 \end{array}$$

Subtracting Decimals Using Equivalence

$$\begin{array}{c} 4 \\ \swarrow \searrow \\ \textcircled{3} \quad \textcircled{1} \end{array} - 0.6 = 3.4$$

$$1 - 0.6 = \boxed{}$$



1 = 10 tenths
0.6 = 6 tenths

Year 6 Subtraction

SUBTRACTION

Subtraction within Order of Operations

First, carry out all the operations in ().

Next, perform all the multiplication and division.

Then, calculate all the addition and subtraction.

$$15 - 4 \times 3 = 15 - 12 \\ = 3$$

$$(15 - 4) \times 3 = 11 \times 3 \\ = 33$$

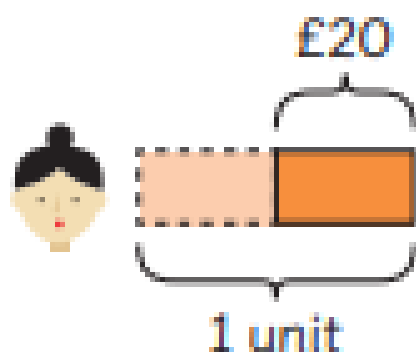


Follow the order of operations. Multiply, then subtract.

First, do the subtraction in the (). Then multiply.



Bar Models



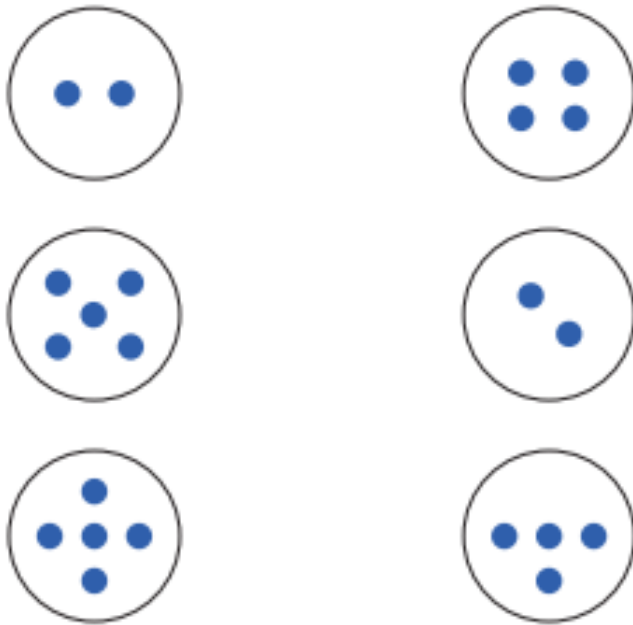
$$\boxed{} = £40 - £20 \\ = £20$$



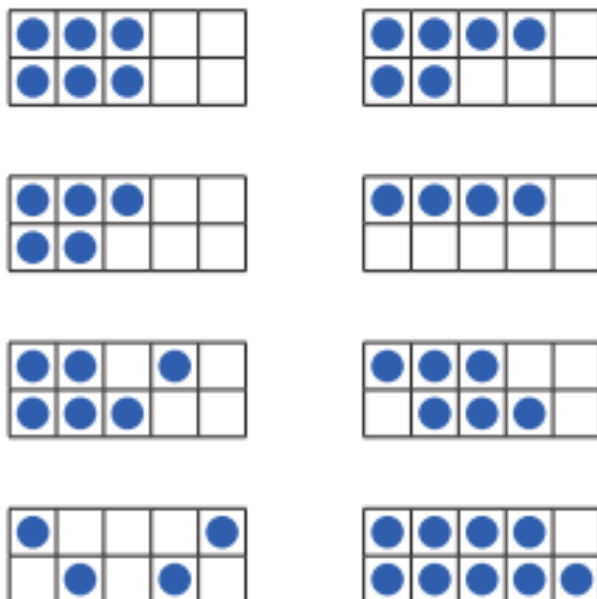
Reception Multiplication



Equal Groups



Addition



Year 1 Multiplication



Equal Groups



There are 2  in each group.
Each group has an equal number
of .
The balls are in equal groups.

How many  are
in each group?



Repeated Addition

There are 3 equal groups.
Each group has 2 counters.
There are 6 counters altogether.



Year 1 Multiplication



Counting in 2s, 5s and 10s

There are 3 groups of 2



2



2



2

3 groups of 2 = 6

3 twos = 6

There are 6



2, 4, 6



Arrays



1 row of 5 = 5

There are 3 rows.



2 rows of 5 = 10



3 rows of 5 =



3 rows of 5

3 fives = 15

There are 15 children altogether.



Doubles



double 1 = 2 ones
double 1 = 2



double 2 = 2 twos
double 2 = 4



double 4 = 2 fours
double 4 = 8

Double means twice the amount.



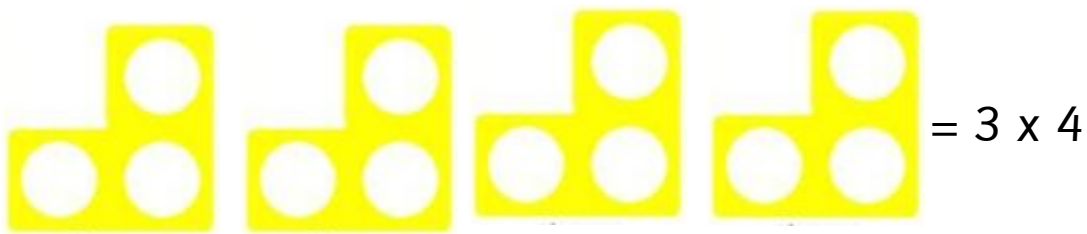
Jacob uses 8 blocks next.



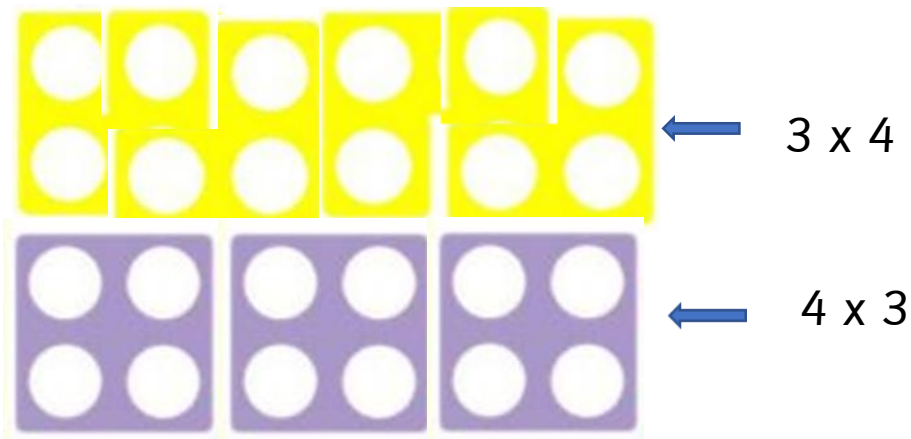
Year 1 Multiplication



Using Numicon



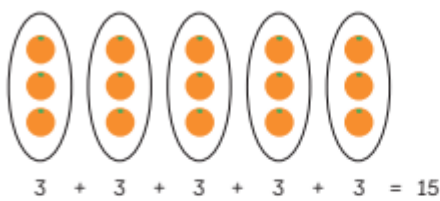
Commutativity



Year 2 Multiplication



Equal Groups



There are 5 groups of 3 oranges.



There are 15 oranges in total.

5 threes = 15

5 groups of 3 = 15

$5 \times 3 = 15$

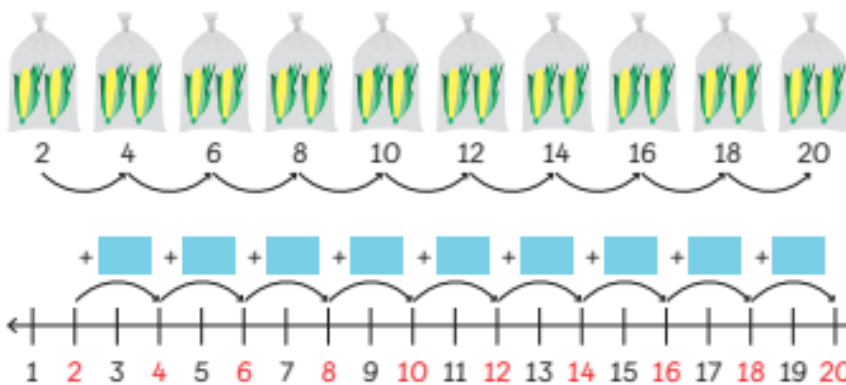
5 times 3 equals 15

We read $5 \times 3 = 15$ as 5 times 3 equals 15.

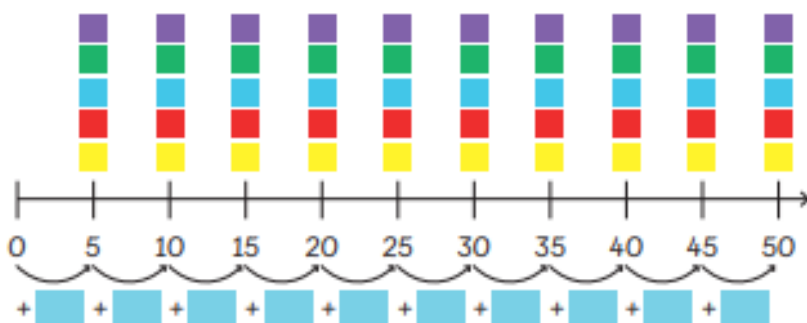


$\times$ means to multiply.

Counting in 2s, 5s and 10s



Number line



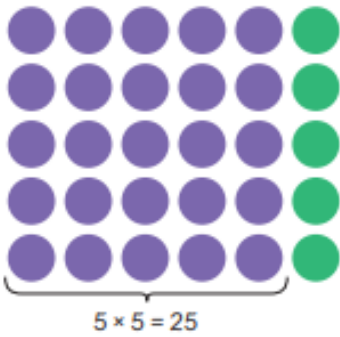


Year 2 Multiplication



Associated Facts

$$6 \times 5 =$$



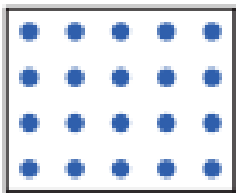
$$6 \times 5 = 25 + 5 \\ = 30$$

$$5 \times 5 = 25$$

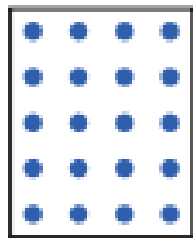
How can this help us work out 6×5 ?



Commutativity



$$4 \times 5 = 20$$



$$5 \times 4 = 20$$

$$4 \times 5 = 5 \times 4$$



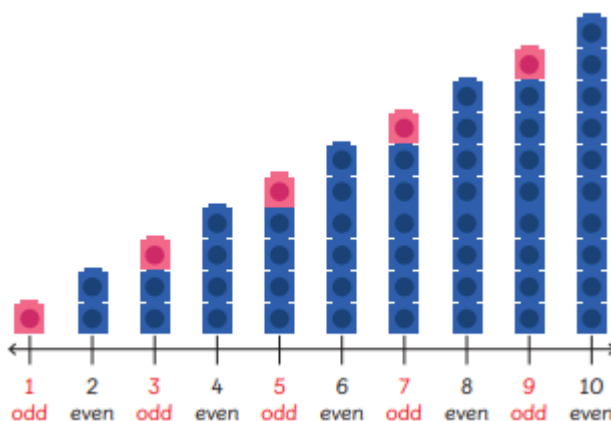
Fact Families

$10 \times 2 = 20$	$20 \div 2 = 10$
$2 \times 10 = 20$	$20 \div 10 = 2$

There is a relationship between the multiplication and division facts.



Odd and Even Numbers

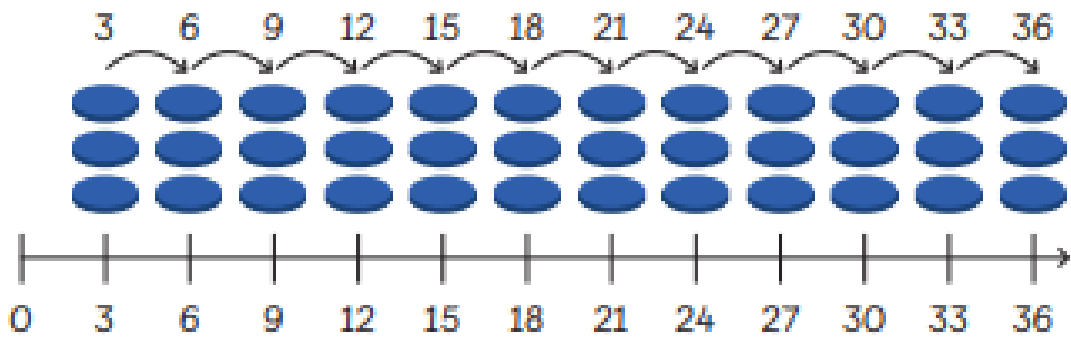




Year 3 Multiplication



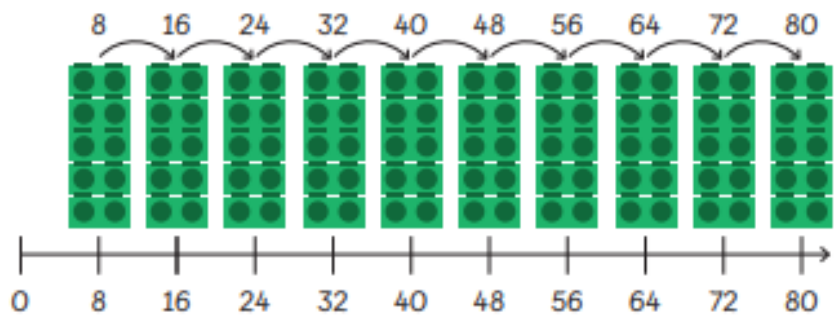
Counting in 3s, 4s and 8s



Equal Groups



Number Line



Associated Facts



$$\begin{aligned} 4 \times 3 &= 12 \\ 5 \times 3 &= 12 + 3 \\ &= 15 \end{aligned}$$



Year 3 Multiplication



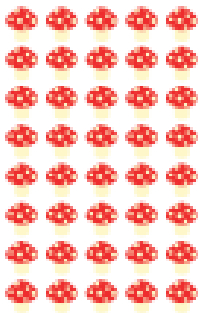
Number Patterns



Commutativity



There are 5 rows of 8 mushrooms.
 $5 \times 8 = 40$



There are 8 rows of 5 mushrooms.
 $8 \times 5 = 40$

There are 40 mushrooms.

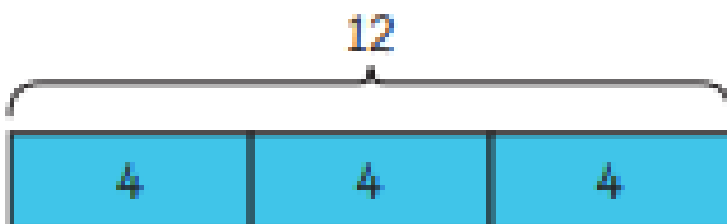
5×8 is the same
as 8×5 .



Fact Families

$$12 \div 3 = 4$$

$$4 \times 3 = 12$$



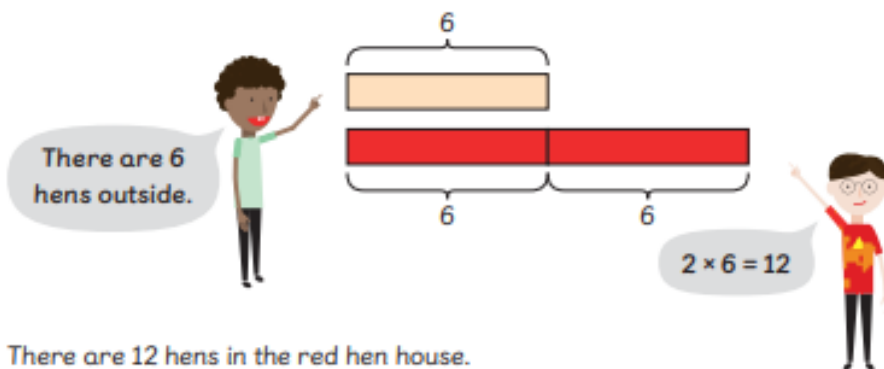
Year 3 Multiplication



Multiplication Using Bar Models

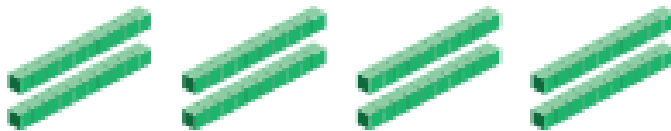


How many hens are in the red hen house?



Base 10

Multiply 2 tens by 4.



$$4 \times 2 \text{ tens} = 8 \text{ tens}$$

$$4 \times 20 = 80$$

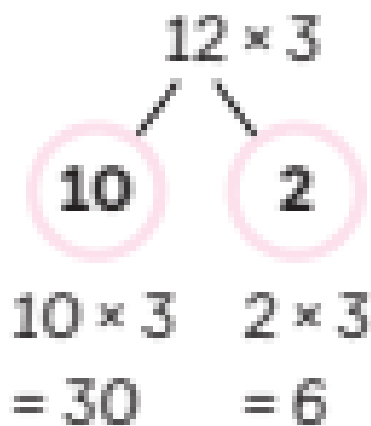
$$8 \text{ tens} = 80$$



Year 3 Multiplication



Number Bonds



Formal Written Method

Step 1 Multiply the ones.

$$\begin{array}{l}
 6 \text{ ones} \times 4 = 24 \text{ ones} \\
 24 \text{ ones} = 2 \text{ tens} + 4 \text{ ones}
 \end{array}$$

$$\begin{array}{r}
 \boxed{2 \text{ tens}} \left. \begin{array}{c} 2 \\ 3 \end{array} \right\} \begin{array}{c} 6 \\ 4 \end{array} \\
 \times \quad \begin{array}{c} 4 \\ 4 \end{array} \\
 \hline
 \begin{array}{c} 4 \\ 4 \end{array} \left. \begin{array}{c} 2 \\ 4 \end{array} \right\} \boxed{4 \text{ ones}}
 \end{array}$$

Step 2 Multiply the tens.

$$\begin{array}{l}
 3 \text{ tens} \times 4 = 12 \text{ tens} \\
 12 \text{ tens} + 2 \text{ tens} = 14 \text{ tens}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{c} \text{h} \quad \text{t} \quad \text{o} \\ \quad \quad 2 \\ \quad \quad 3 \end{array} \begin{array}{c} 6 \\ 4 \end{array} \\
 \times \quad \begin{array}{c} 4 \\ 4 \end{array} \\
 \hline
 \begin{array}{c} 1 \quad 4 \quad 4 \end{array}
 \end{array}$$

$$36 \times 4 = 144$$



Year 4 Multiplication



Counting in 6s, 7s and 9s

Count on in sixes.

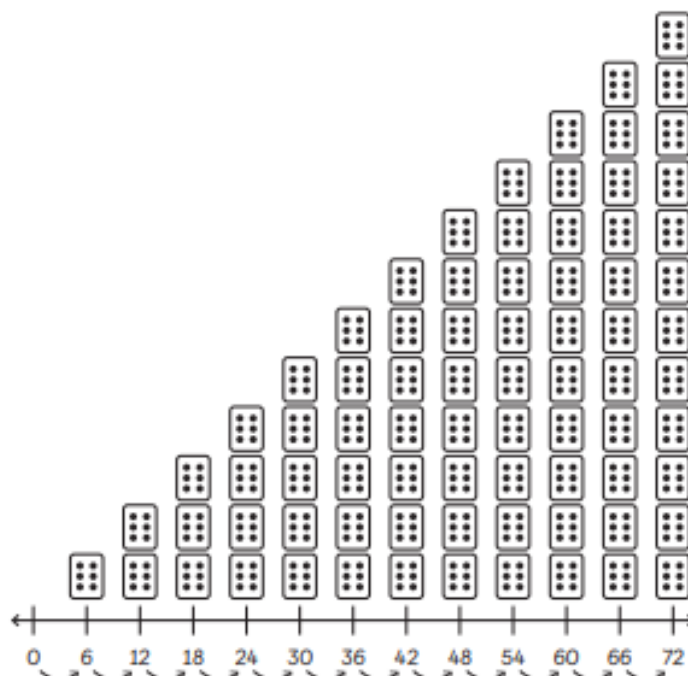
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Equal Groups



4 boxes of 6
 $4 \times 6 = 24$

Number Line





Year 4 Multiplication



Multiplying by 11 and 12 Using Associated Facts



$$10 + 10 + 10 = 30$$



$$1 + 1 + 1 = 3$$

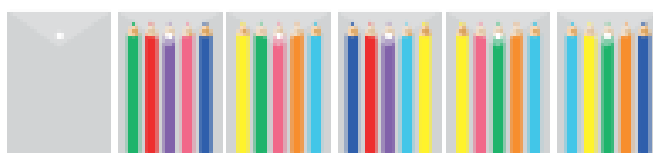


$$3 \times 10 = 30$$

$$3 \times 1 = 3$$

$$3 \times 11 = 30 + 3 = 33$$

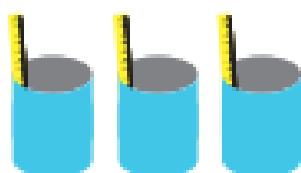
Fact Families



$$30 \div 6 = 5$$

$$6 \times 5 = 30$$

Multiplying by 0 and 1



3 pots of 1 ruler

$$3 \times 1 = 3$$



3 empty pots

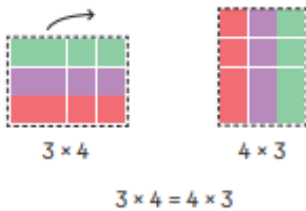
$$3 \times 0 = 0$$



Year 4 Multiplication

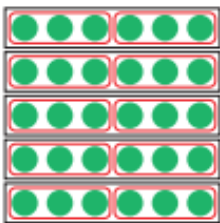


Commutativity

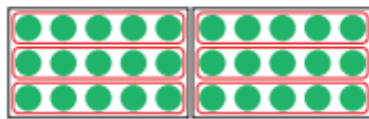


3×4 is equal to 4×3 .

$5 \times 2 \times 3 =$



$2 \times 3 \times 5 =$

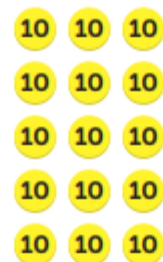


Multiplying Multiples of 10

30 is equal to 3 tens.

$5 \times 3 = 15$

$5 \times 3 \text{ tens} = 15 \text{ tens}$
 $= 150$



$5 \times 30 = 150$

Formal Method

$\begin{array}{r} 218 \\ \times 4 \\ \hline 872 \end{array}$	$\longrightarrow$	$\begin{array}{r} 8 \times 4 = 32 \\ 10 \times 4 = 40 \\ 200 \times 4 = 800 \\ \hline 218 \times 4 = 872 \end{array}$
--	-------------------	---

Year 5 Multiplication



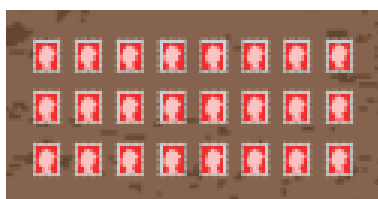
Multiples



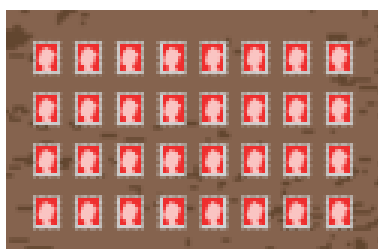
1 row of 8 stamps.
 $1 \times 8 = 8$



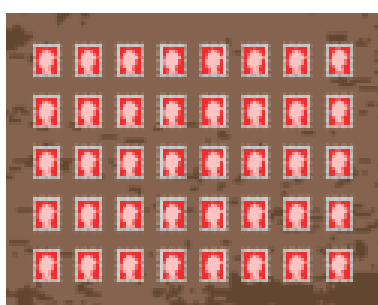
2 rows of 8 stamps.
 $2 \times 8 = 16$



3 rows of 8 stamps.
 $3 \times 8 = 24$



4 rows of 8 stamps.
 $4 \times 8 = 32$



5 rows of 8 stamps.
 $5 \times 8 = 40$

A multiple is a number you get when you multiply one number by another number.

8, 16, 24, 32 and 40 are multiples of 8.



The product of 5 and 8 is 40.

40 is a multiple of 5.
40 is also a multiple of 8.



Sam has 40 stamps altogether.

Finding Factors



2 rows of 12 tiles
 $2 \times 12 = 24$

2 and 12 are factors of 24.



Factors are the numbers we multiply together to make another number. 2 and 12 are factors of 24 because $2 \times 12 = 24$.

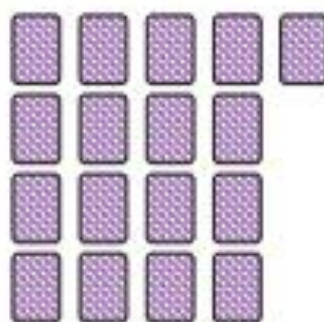
Year 5 Multiplication



Prime Numbers



This is a rectangle.



These are not rectangles.

There is only one way to arrange 17 cards.

$$17 = 1 \times 17$$

17 only has two factors, 1 and itself. 17 is a prime number.

Composite Numbers



$$6 = 1 \times 6$$



$$6 = 2 \times 3$$



$$8 = 1 \times 8$$



$$8 = 2 \times 4$$



$$10 = 1 \times 10$$



$$10 = 2 \times 5$$

2 is the only even prime number.

All other multiples of 2 have more than two factors.

Year 5 Multiplication



Square and Cube Numbers



Holly would need 9 square tiles to make a larger square.



1 row of 1
 $1 \times 1 = 1^2$
 $= 1$



2 rows of 2
 $2 \times 2 = 2^2$
 $= 4$



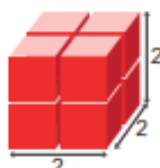
3 rows of 3
 $3 \times 3 = 3^2$
 $= 9$



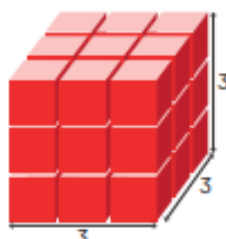
Sam would need 27 cubes to make a larger cube.



$1 \times 1 \times 1 = 1^3$
 $= 1$



$2 \times 2 \times 2 = 2^3$
 $= 8$



$3 \times 3 \times 3 = 3^3$
 $= 27$

Multiplying by 10, 100 and 1000

$$5 \times 1000 = \boxed{}$$

$$5 \times 1 \text{ thousand} = 5 \text{ thousands}$$

$$5 \times 1000 = 5000$$

Multiplying Fractions

$$\frac{1}{5} \times \boxed{}$$

$$3 \times \frac{1}{5} = \frac{3}{5} \times \boxed{}$$

Formal Written Method

Multiply 253 by 17.

$$\begin{array}{r} 253 \\ \times 17 \\ \hline 1771 \\ + 2530 \\ \hline 4301 \end{array}$$

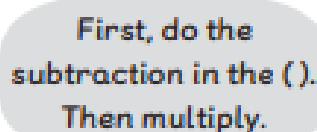
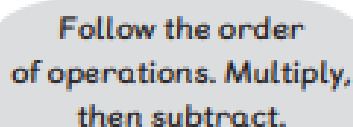


$$\begin{array}{r} 253 \\ \times 7 \\ \hline 1771 \end{array}$$



First, carry out all the operations in ().
Next, perform all the multiplication and division.
Then, calculate all the addition and subtraction.

$$(15 - 4) \times 3 = 11 \times 3$$
$$= 33$$



Multiplying by 2 digit Numbers

$\text{£}1229 \times 28 =$

[illegible]



Year 6 Multiplication



Common Factors



1 row of 18 bags

$$1 \times 18 = 18$$



2 rows of 9 bags

$$2 \times 9 = 18$$



3 rows of 6 bags

$$3 \times 6 = 18$$

1, 2, 3, 6, 9 and 18
are factors of 18.



Common Multiples

Multiples of 4	4	8	12	16	20	24	28	32	36	40	44	48
Multiples of 6	6	12	18	24	30	36	42	48	54	60	66	72
Multiples of 8	8	16	24	32	40	48	56	64	72	80	88	96

24 and 48 are common
multiples of 4, 6 and 8.

Year 6 Multiplication



Prime Numbers



$$8 = 5 + 3$$



$$10 = 7 + 3$$



$$16 = 11 + 5$$



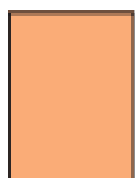
8 is a composite number.
5 and 3 are prime numbers.

Can all even numbers
be written as the sum of
two prime numbers?

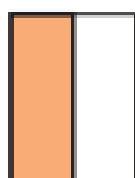


Multiplying Fractions

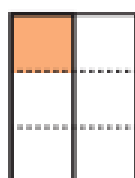
$$\frac{1}{3} \times \frac{1}{2} \text{ l} = \text{[blue square]}$$



= 1 l of juice



$$\frac{1}{2} \text{ l}$$



$$\frac{1}{3} \times \frac{1}{2} \text{ l}$$

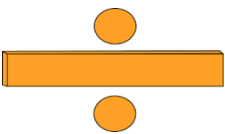
$$\frac{1}{3} \text{ of } \frac{1}{2} \text{ l is } \frac{1}{6} \text{ l.}$$

Multiplying Decimals

$$\begin{array}{r} 7.23 \\ \times 6 \\ \hline 43.38 \end{array}$$



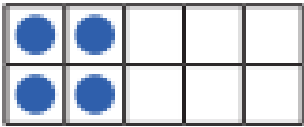
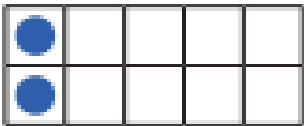
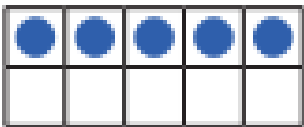
Reception Division



Equal Groups

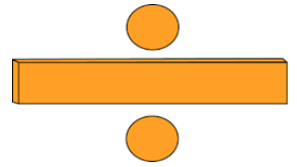


Subtraction





Year 1 Division



Equal Groups



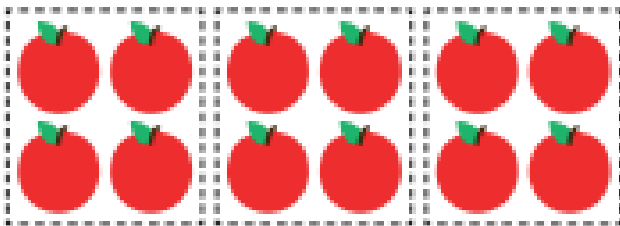
There are 2  in each group.
Each group has an equal number
of .
The balls are in equal groups.

How many  are
in each group?



Grouping

Sam has 12 apples.
He puts the apples into groups of 4.



Each group has an
equal number of



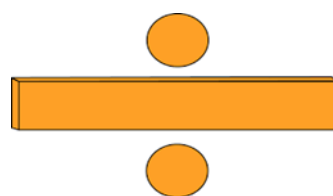
How many groups does he make?

Sam makes groups.





Year 1 Division



Sharing

10 medals are shared equally among 5 friends.
How many medals does each friend get?



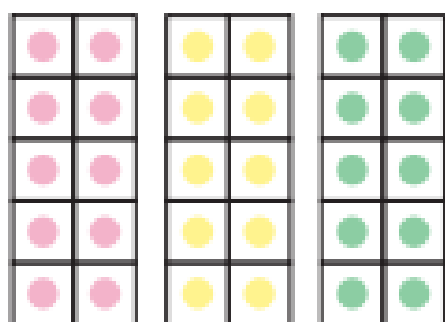
Divide 10 medals into 5 groups.



Each friend gets 2 medals.



Counting in 2s, 5s and 10s



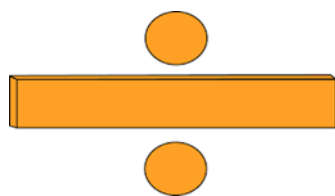
10 20 30 31 32 33 34 35 36

I can use  to help me count in tens and ones.





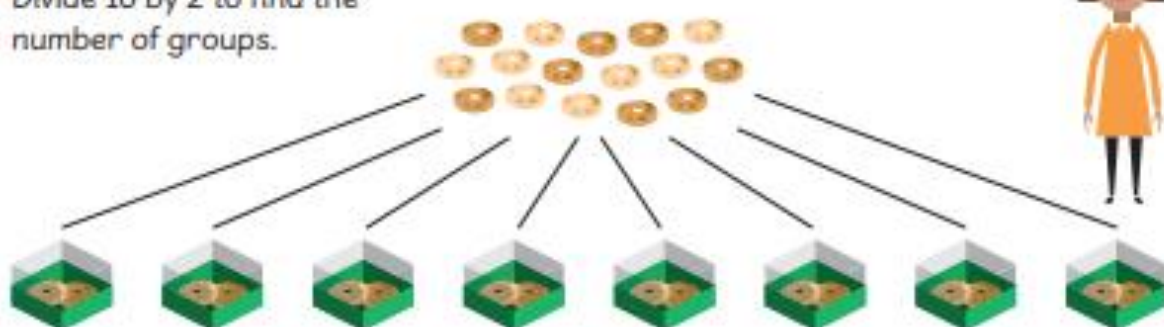
Year 2 Division



Grouping

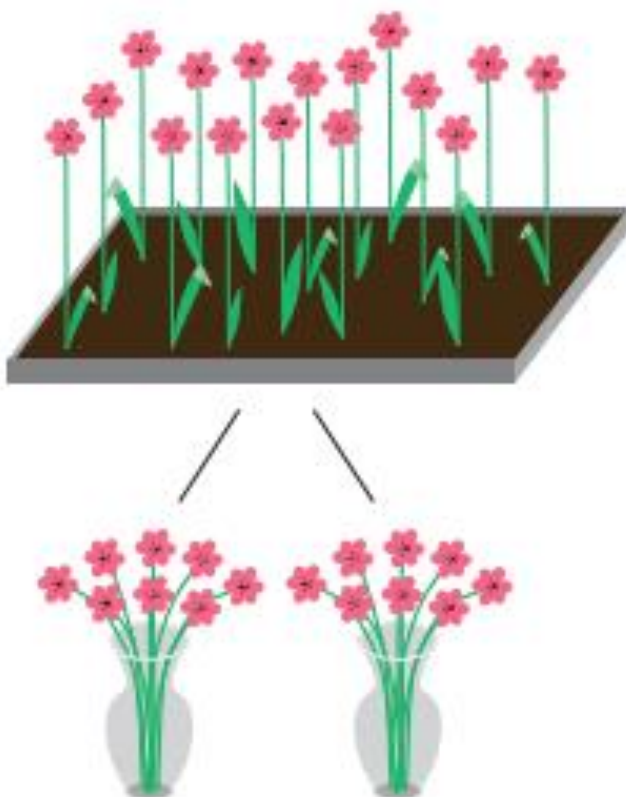
There are 16 bagels.
Divide 16 by 2 to find the
number of groups.

I put 2 bagels in each box.
There are 8 groups of 2.



Sharing

There are 16 flowers.
Elliott cuts the flowers and puts them equally into 2 vases.

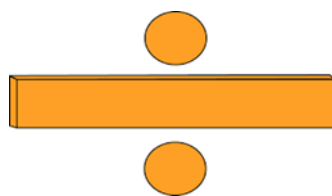


There are 8 flowers in each vase.

$$16 \div 2 = 8$$

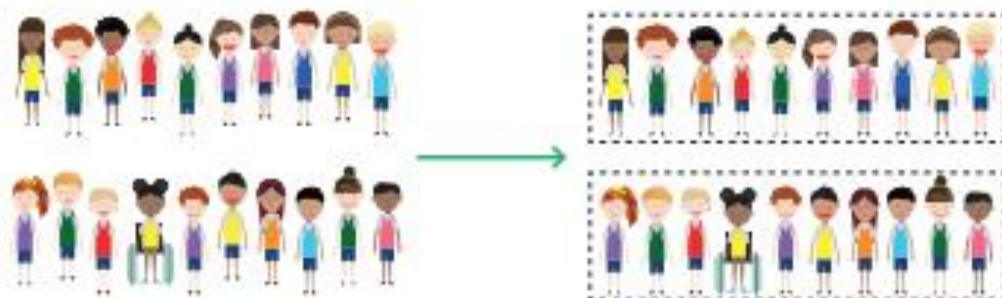


Year 2 Division



Division by 2, 5 and 10

20 children can be put into teams of 10.



$$20 \div 10 = 2$$

There are 2 equal teams.

There are 2 groups of 10 children.

$$2 \times 10 = 20$$



$10 \times 2 = 20$	$20 \div 2 = 10$
$2 \times 10 = 20$	$20 \div 10 = 2$

There is a relationship between the multiplication and division facts.



This is a multiplication and division fact family.

Odd and Even Numbers



2 cubes can be put into a group of 2.

4 cubes can be put into groups of 2.

6 cubes can be put into groups of 2.

2, 4 and 6 are even numbers.



1 cube cannot be put into a group of 2.

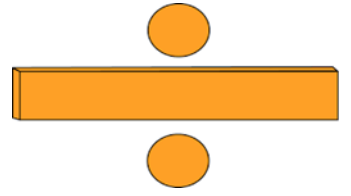
3 cubes cannot be put into groups of 2.

5 cubes cannot be put into groups of 2.

7 cubes cannot be put into groups of 2.

1, 3, 5 and 7 are odd numbers.

Year 3 Division



Dividing by 3, 4 and 8

Sam put 32 cobs of corn into 4 equal groups.



4 groups
of 8 is 32.

$$4 \times 8 = 32$$

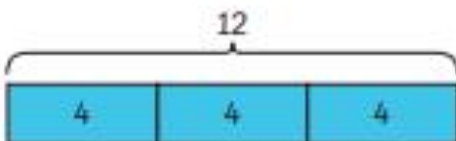
$$32 \div 4 = 8$$

Each group has 8 cobs of corn.



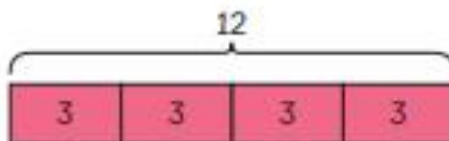
Division with Word Problems

Amira and Ruby are making pizzas.
They have 12 olives.
They want to put 3 or 4 olives on each pizza.
Can we make a family of multiplication and
division equations to help them?



4 times 3 is 12, so
12 divided by 3 is 4.

12 divided into groups
of 4 is equal to 3.



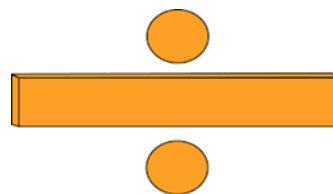
3 times 4 is 12, so
12 divided by 4 is 3.

12 shared between
4 is equal to 3.





Year 4 Division



Dividing by 6, 7 and 9



$$30 \div 6 = 5$$

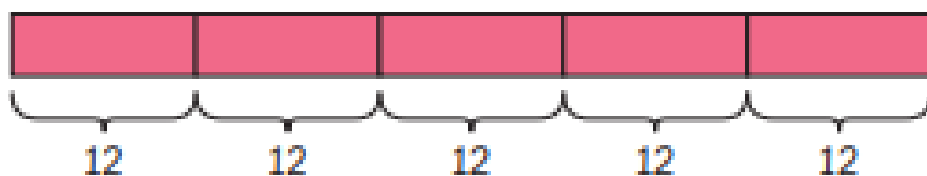
$$6 \times 5 = 30$$

Each packet can hold 5 pencils.

When 30 is divided by 6,
the quotient is 5.



Dividing by 11 and 12



$$5 \times 12 = \square$$

$$\square \div 12 = \square$$

$$12 \times 5 = \square$$

$$\square \div 5 = \square$$

Dividing with Remainders

There are 13 flowers.



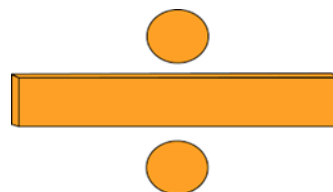
$$13 \div 3 = 4 \text{ with } 1 \text{ left over}$$

The quotient is 4.

The remainder is 1.



Year 4 Division



Word Problems Involving Division

hat 

tennis racket 

} £54

6 units $\longrightarrow$ £54
1 unit $\longrightarrow$ £54 $\div$ 6 = £9

Dividing by 1


 $\downarrow$

 $12 \div 4 = 3$ 


 $\downarrow$

 $12 \div 3 = 4$ 


 $\downarrow$

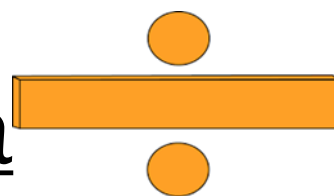
 $12 \div 2 = 6$ 


 $\downarrow$

 $12 \div 1 = 12$ 



Year 4 Division



Dividing 2 digit numbers

Step 1 Divide 4 tens by 2.



4 tens $\div$ 2 = 2 tens

$$40 \div 2 = 20$$

$$\begin{array}{r} 20 \\ 2 \overline{) 46} \\ \underline{- 40} \end{array}$$

Step 2 Divide 6 ones by 2.



6 ones $\div$ 2 = 3 ones

$$6 \div 2 = 3$$

$$46 \div 2 = 23$$

$$\begin{array}{r} 23 \\ 2 \overline{) 46} \\ \underline{- 40} \\ 6 \\ \underline{- 6} \\ 0 \end{array}$$

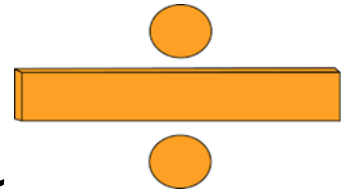
Dividing 3 digit numbers

$$306 \div 3 = \square$$





Year 5 Division



Finding multiples



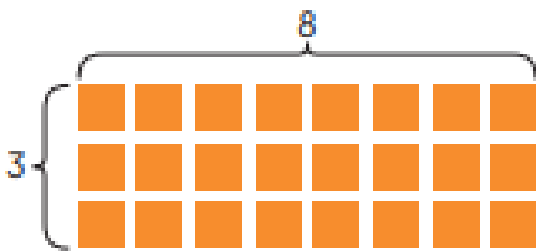
4 rows of 8
stamps.
 $4 \times 8 = 32$

A multiple is a number
you get when you multiply
one number by another
number.

8, 16, 24, 32 and 40
are multiples of 8.



Finding Factors



3 rows of 8 tiles
 $3 \times 8 = 24$

3 and 8 are factors of 24.



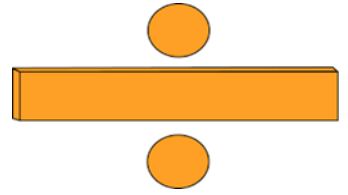
Find Common Factors

Factors of 10:
1, 2, 5, 10

Factors of 15:
1, 3, 5, 15



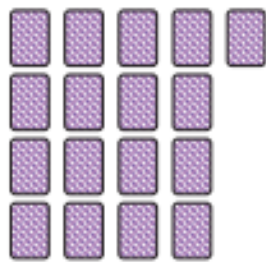
Year 5 Division



Prime and Composite Numbers



This is a rectangle.



These are not rectangles.

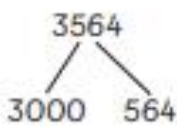
There is only one way to arrange 17 cards.

$$17 = 1 \times 17$$

17 only has two factors, 1 and itself. 17 is a prime number.

Dividing by 10,100 and 1000

How many groups of 1000 can we make from 3564?



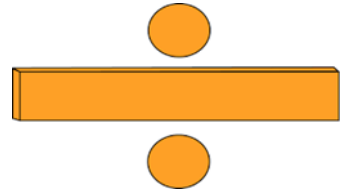
Look at the digit in the thousands place.



Dividing without remainder



Year 5 Division

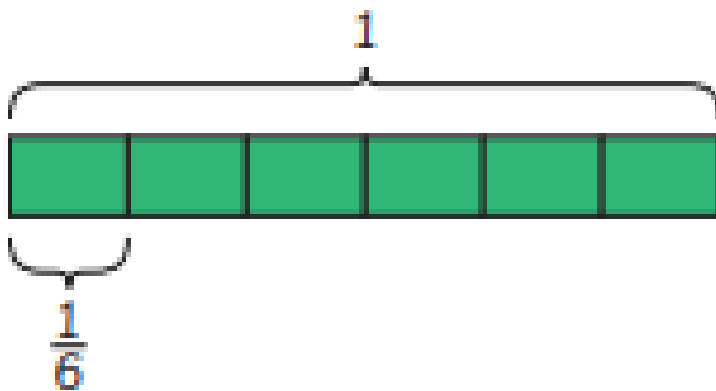


Dividing without remainder



Dividing with remainder

$$\begin{array}{r} 78 \text{ remainder } 1 \\ 6 \overline{) 469} \\ - 420 \longrightarrow 420 \div 6 = 70 \\ \hline 49 \\ 48 \longrightarrow 48 \div 6 = 8 \\ \hline 1 \end{array}$$

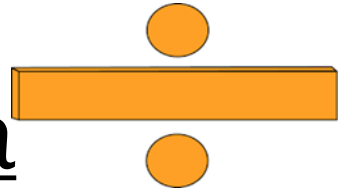


$$1 \div 6 = \frac{1}{6}$$

$$469 \div 6 = 78 \frac{1}{6}$$



Year 6 Division



Order of Operations

$$15 - 4 \times 3 = 15 - 12 \\ = 3$$



Follow the order of operations. Multiply, then subtract.

Dividing by a 2-Digit Number without remainder

$$450 \div 15 = \boxed{}$$

$$45 \text{ tens} \div 15 = 3 \text{ tens}$$

$$450 \div 15 = 30$$

$$450 = 45 \text{ tens}$$



Dividing by a 2-Digit Number with Remainder

$$\begin{array}{r} 32 \text{ remainder } 5 \\ 18 \overline{) 581} \end{array}$$

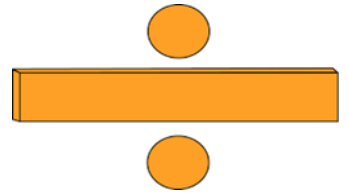


Which division method do you prefer?

$$\begin{array}{c} 581 \\ \swarrow \quad \searrow \\ 540 \quad 41 \\ \downarrow \quad \swarrow \quad \searrow \\ 30 \times 18 \quad 36 \quad 5 \\ \downarrow \quad \downarrow \\ 2 \times 18 \quad \text{remainder} \end{array}$$



Year 6 Division



Common Multiples

Multiples of 4	4	8	12	16	20	24	28	32	36	40	44	48
Multiples of 6	6	12	18	24	30	36	42	48	54	60	66	72
Multiples of 8	8	16	24	32	40	48	56	64	72	80	88	96

Common Factors



1 row of 18 bags
 $1 \times 18 = 18$



2 rows of 9 bags
 $2 \times 9 = 18$



3 rows of 6 bags
 $3 \times 6 = 18$

1, 2, 3, 6, 9 and 18
are factors of 18.



Prime Numbers

Elliott has 7 square tiles.



Elliott can only make 1 rectangular arrangement.



1 row of 7

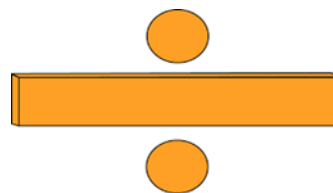
$$1 \times 7 = 7$$

The factors of 7 are 1 and 7.

7 is a prime number.



Year 6 Division



Dividing Fractions by whole numbers

$$\frac{3}{4} \div 4 = \square$$

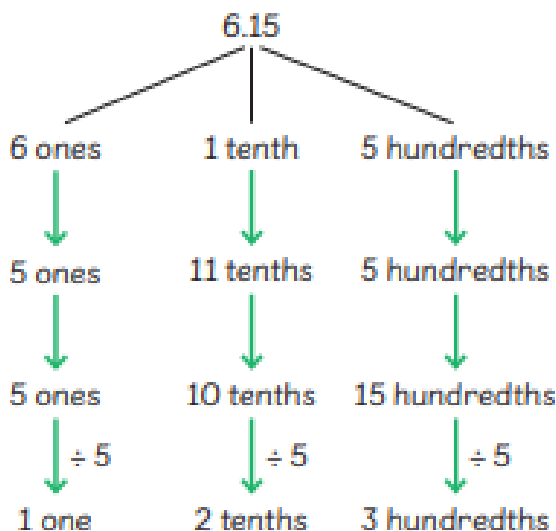


$$\frac{3}{4} \div 4 = \frac{1}{4} \times \frac{3}{4} = \frac{3}{16}$$

Dividing Decimals without renaming

$$\begin{array}{r}
 \square . \square \square \\
 2 \overline{) 8 . 4 2} \\
 \underline{- 8} \longrightarrow 2 \times 4 \\
 0 . 4 \\
 \underline{- 0 . 4} \longrightarrow 2 \times 0.2 \\
 0 . 0 2 \\
 \underline{- 0 . 0 2} \longrightarrow 2 \times 0.01 \\
 0
 \end{array}$$

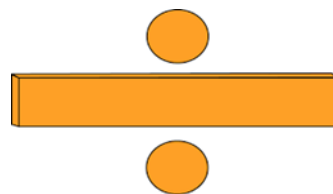
Dividing Decimals with renaming



$$6.15 \div 5 = 1.23$$

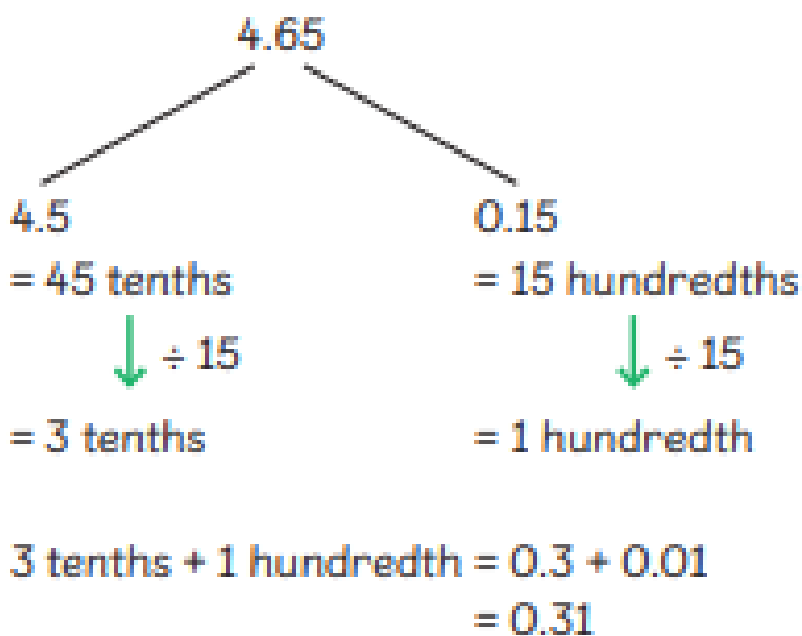


Year 6 Division



Dividing Decimals by a 2-Digit Whole Number

$$4.65 \text{ kg} \div 15 = \text{[blue box]}$$



$$4.65 \div 15 = 0.31$$

Ratio



There are 9 parts in total. Divide 1890 by 9.



Algebra

x	18	3	90
$\frac{x}{3}$			