Growing, loving and learning in the arms of Mary'

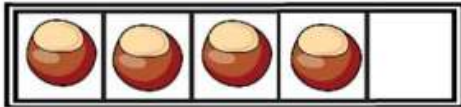# Calculation Policy- Addition and Subtraction

Nursery

- Number rhymes/Number stories
- Number games.
- Opportunities through daily routines e.g. snack, self-registration
- Practical counting activities
- Comparing amounts
- Calculations within 5

Reception

Unit 1: Just like me

Comparing – size and quantity

Making representations of numbers – seeing them as part of a bigger group
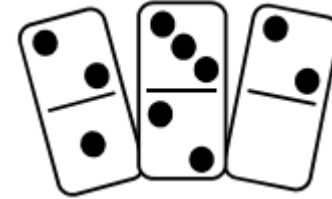
Comparing size

More and fewer

Unit 2: It's me 1,2,3
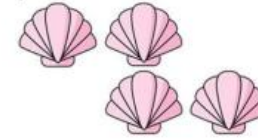
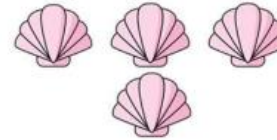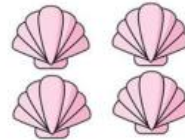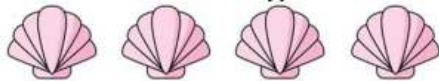**Comparing 1,2,3 . Which has more? Which has fewer?**

Composition of 1,2,3

1 and 2 make 3
1 and another 1 and another
1 make 3.

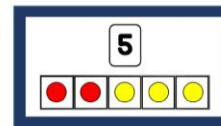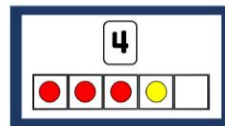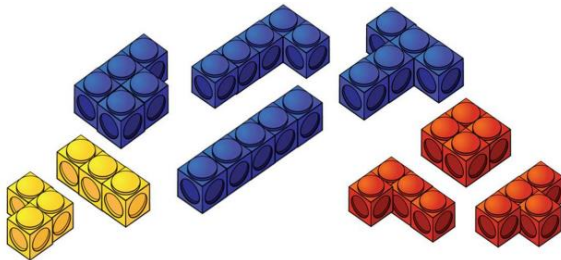**Unit 3: Light and dark**

Representing, comparing and composing 4 and 5

Shake 4 double-sided counters (or painted butter beans) and then let
them fall on the table.
How many counters have landed on the red side?
How many have landed on the yellow side?

4

5

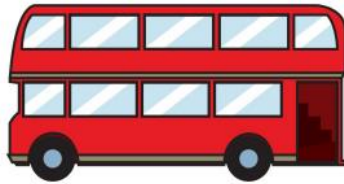How many different ways can you find to make 4?
Now use 5 counters. How many different ways can you find to make 5?
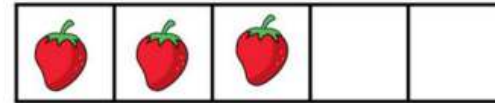
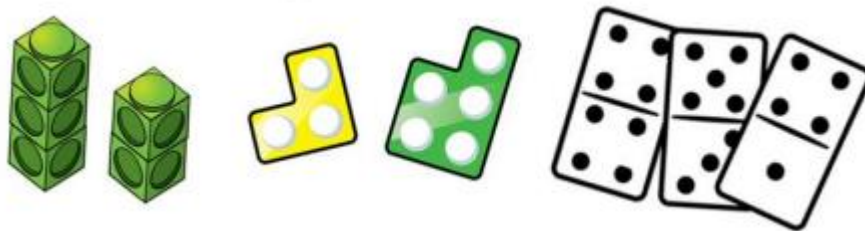Addition and Subtraction

1 more and 1 less

Number songs

Number stories

Five frames

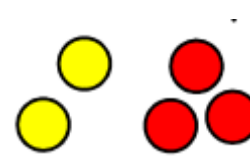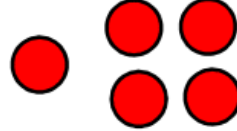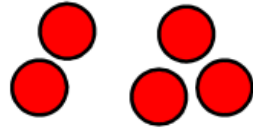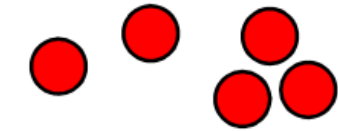<u>Unit 4: Alive in 5:</u>

Comparing numbers to 5

Encourage children to subitise smaller numbers.

Focusing on 2 parts or more than 2 parts

Addition and Subtraction

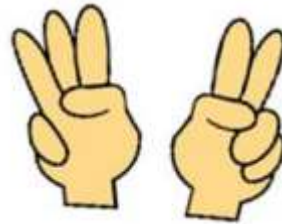**Composition of 4 and 5**

1 and 1 and 3 make 5

2 and 3 make 5

1 and 4 make 5
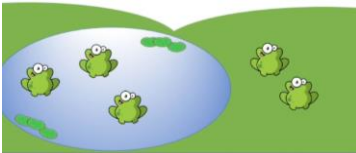
Addition and Subtraction

Representing, comparing and composing 6, 7 and 8
Combining groups

How many purple?

How many blue? How many altogether?
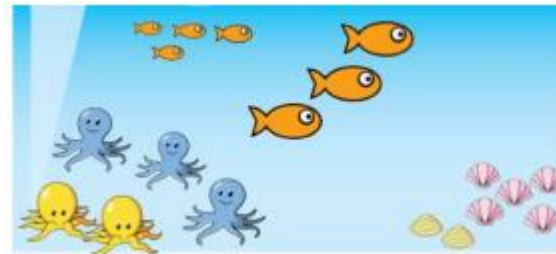
How many small fish? How many big fish?

How many altogether?
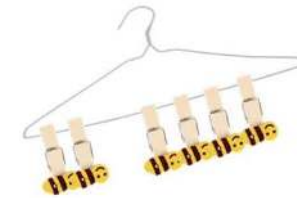
Looking at fifferent ways of

making 6, 7 and 8.

Dot Plates

Provide children with dot plates or cards from 0 to 5
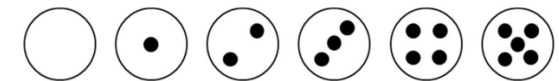
Ask the children to arrange the 6 plates so that they have:

- a pair of plates with a total of 4 dots
- a pair of plates with a total of 5 dots
- a pair of plates with a total of 6 dots

Exploring Possibilities

Jack rolled 2 dice and scored 10

Amir scored less than Jack.
One of Amir's dice showed 5.

What other number could Amir have rolled?
Is there more than one answer?
Are there any numbers Amir could not have rolled?

4

5

6
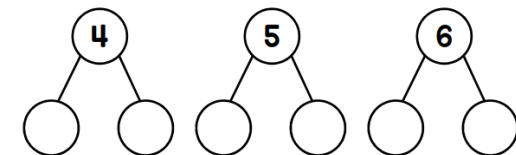
Is there more than one way to solve the problem?

Addition and Subtraction

Unit 6: Building 9 and 10

Representing, comparing and composing 9 and 10
Comparing numbers to 10
Bonds to 10

Ask the children to explore different ways of building the bonds to 10 E.g. How many ways can they find to park 10 cars in 2 car parks, place 10 fairies on 2 toadstools, 10 dinosaurs in 2 Jurassic parks.
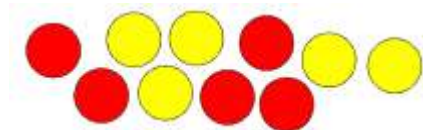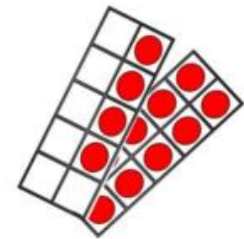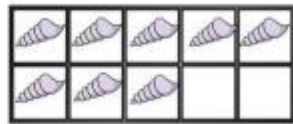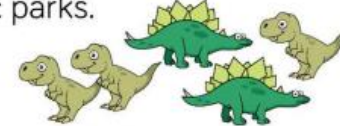
How many red? How many yellow?

Addition and Subtraction

Consolidating Key Skills: Subitising, sorting and matching, composition, counting, comparing and ordering

Building numbers beyond 10

Shuffle the 11-20 numeral cards and select one at a time.
Represent each number in different ways.
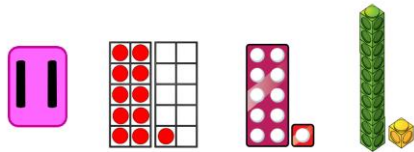
You could use cubes or objects from around your house.
You could also use the ten frames on the next page to help you.
What do you notice about each number?

Counting patterns beyond 10
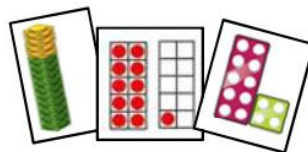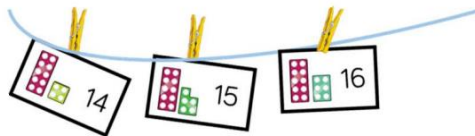
Bingo
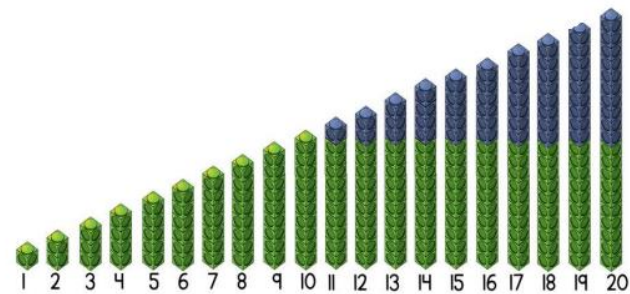
Addition and Subtraction

Subitising, sorting and matching, composition, counting, comparing and ordering
Adding more

First there were 2 people on the bus.
Then 2 more people got on the bus.
Now there are 4 people on the bus.
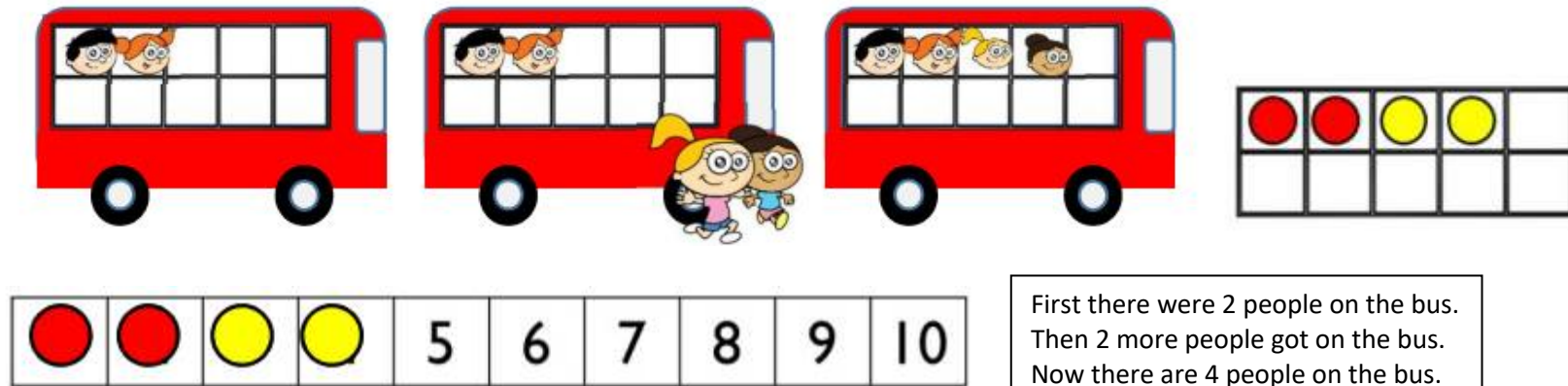
Taking away

Addition and Subtraction
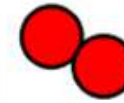
First there were 5 people on the bus.
Then 2 people got off.
Now there are 3 people on the bus.

Gather together some toys and a box.
Create your own first, then, now stories as different toys fall out of the toybox.

How many toys were in the toybox first?
Then how many fell out?
How many are left now?

With a friend collect ten objects to play the taking away game.
Take it in turns to take away 1, 2 or 3 objects.

2
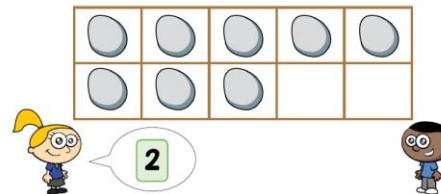
How many objects are left each time?
The player that avoids taking away the last object wins the game.

Unit 9: Find my pattern

Subitising, sorting and matching, composition, counting, comparing and ordering
Doubling
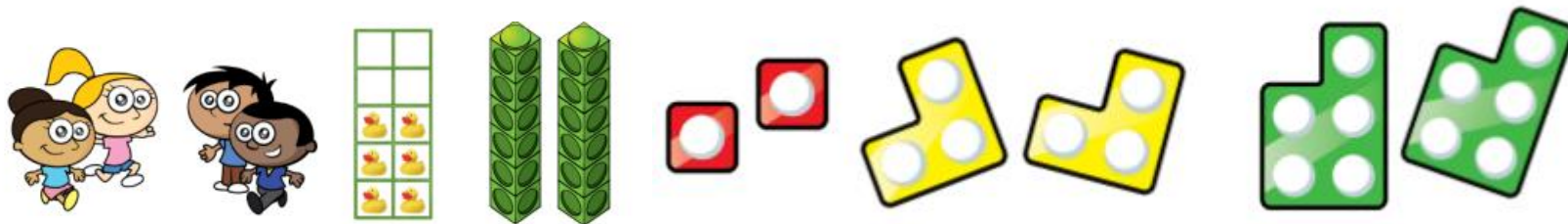
Addition and Subtraction

Sharing and grouping
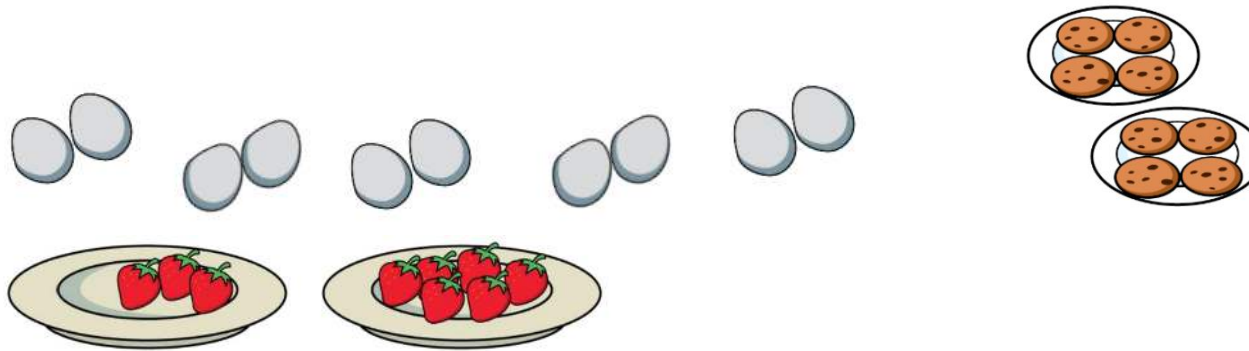
Opportunities provided to explore sharing.
Is this fair? What if another friend came?

Even and odd
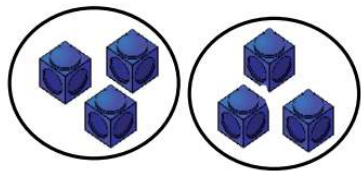
6 in 2 equal groups
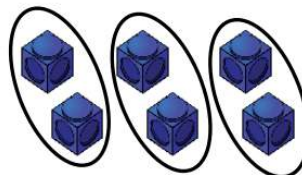
6 in groups of 2 (pairs)
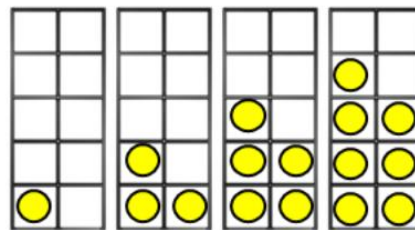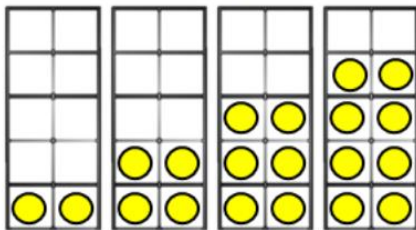
Children build pair-wise patterns on the 10 frames and sort them into those which have two equal groups (even numbers) and those which have two unequal groups (odd
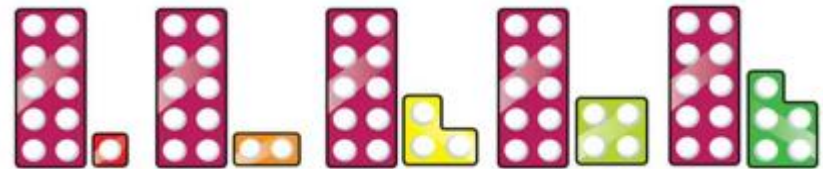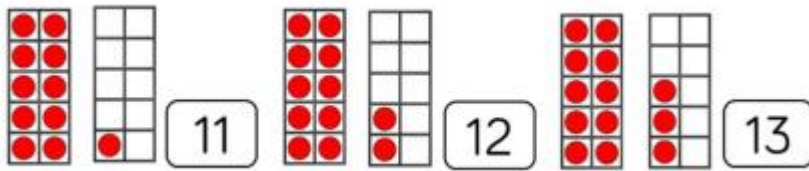
Addition and Subtraction

Unit 10: On the move

Consolidating Key Skills: Subitising, sorting and matching, composition, counting, comparing and ordering

Patterns and relationships

Children should be given opportunities to explore and investigate relationships between numbers

Gather together a bucket and some of your favourite toys.
First, place a number of toys inside the bucket.
Then, ask a friend to add more toys or take some out while you watch.
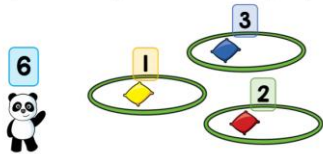
Can you predict how many toys will be in the bucket now?
Will there be more or fewer?

Who could be in Mr Gumpy's boat if there are 8 legs altogether.
What if there are 6 legs or 10? Who could be in the boat this time?
I wonder if there could be 9 legs in the boat?

You could draw pictures to help you to work it out.

Gather three hoops or buckets and number them 1, 2 and 3
Throw your bean bags and then add up your points.

3

1

2

6

How many points have you scored?

Is there more than one way to score 6 points?
What is the highest possible score?

Addition and Subtraction

Addition

Skill	Year	Representations and models	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square

Addition and Subtraction

Skill	Year	Representations and models	
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters Column addition
Add with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

Addition and Subtraction

Skill: Add 1-digit numbers within 10	Year: 1

$$4 + 3 = 7$$
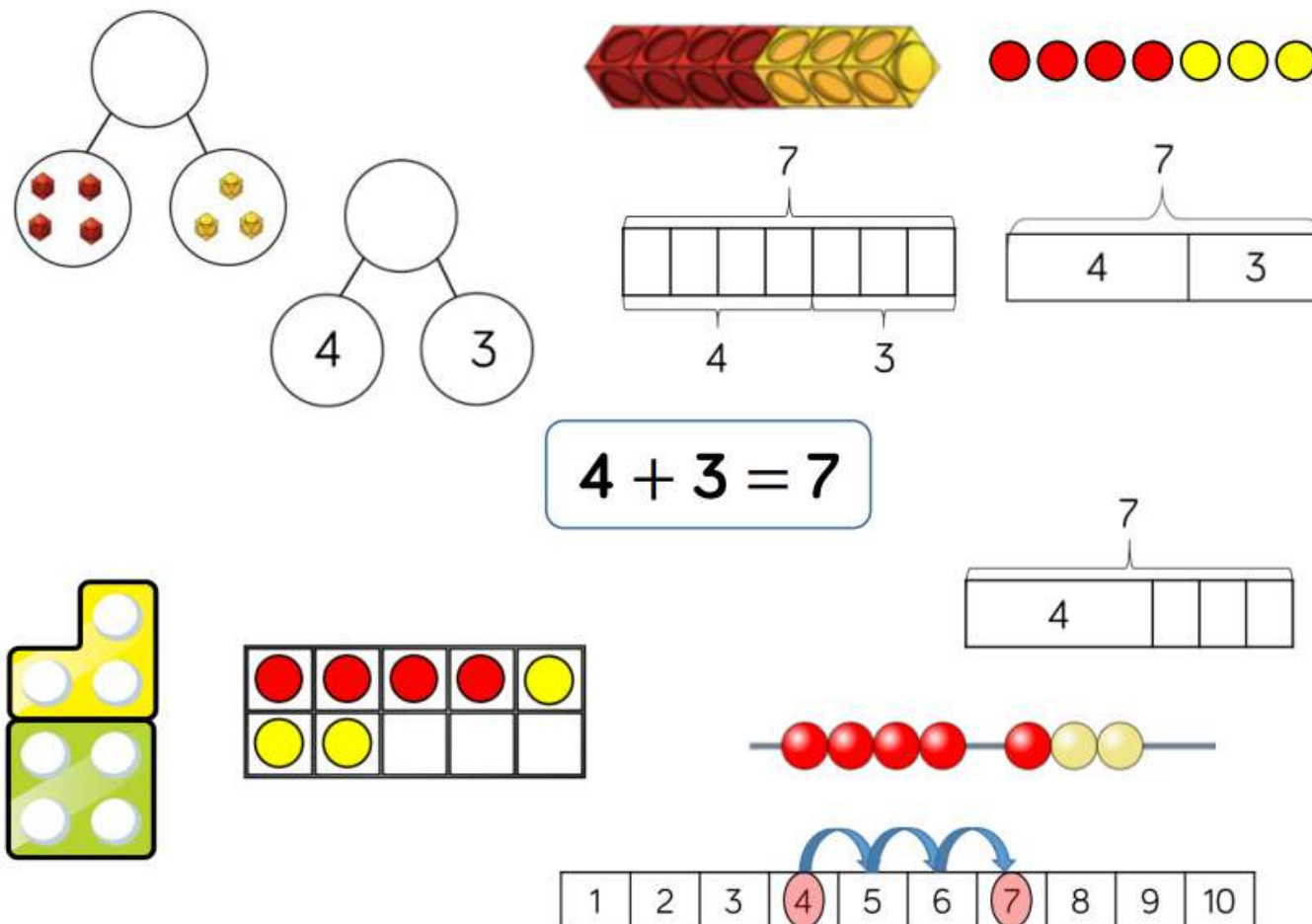
When adding numbers to 10, children can explore both aggregation and augmentation.

The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation.

The combination bar model, ten frame, bead string and number track all support augmentation.

Addition and Subtraction

Skill: Add 1 and 2-digit numbers to 20	Year: 1/2

7

8

15

8	7

$$8 + 7 = 15$$

$8 + 7 = 15$

2   5

$+ 2$ $+ 5$

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
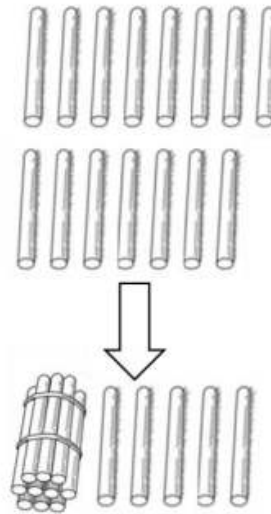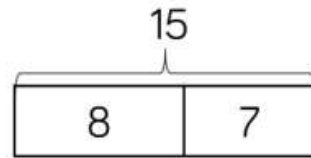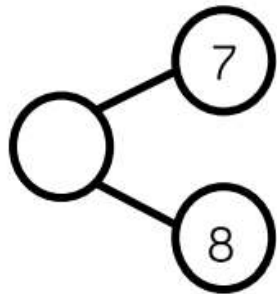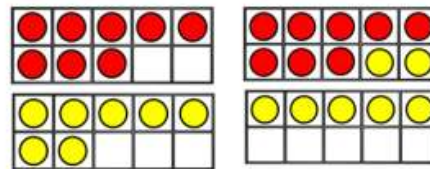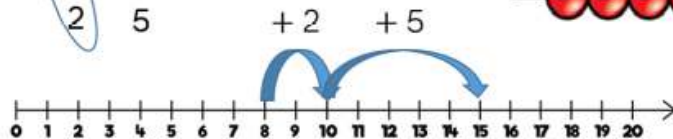
$8 + 7 = 15$

2   5

When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.

Addition and Subtraction

Skill: Add three 1-digit numbers	Year: 2

16

7 6 3

$$7 + 6 + 3 = 16$$

$7 + 6 + 3 = 16$

10

16
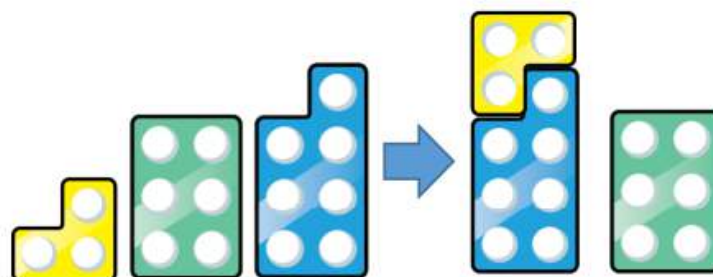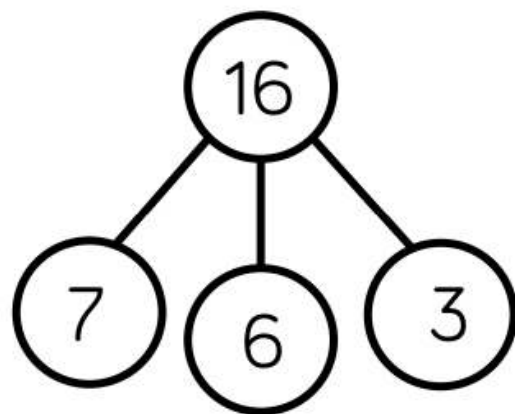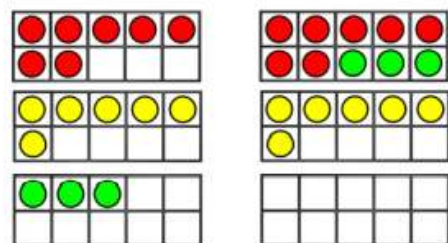
When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

Addition and Subtraction

Skill: Add 1-digit and 2-digit numbers to 100	Year: 2/3

38

5

?

38

35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

+2   +3

38   40   43
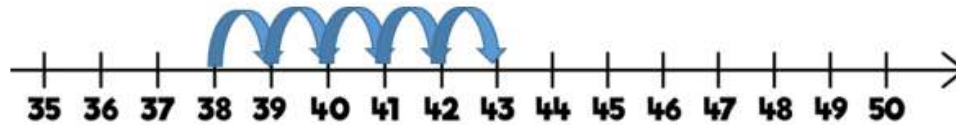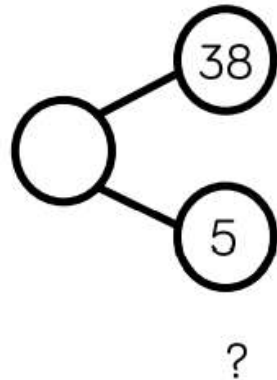
$$38 + 5 = 43$$

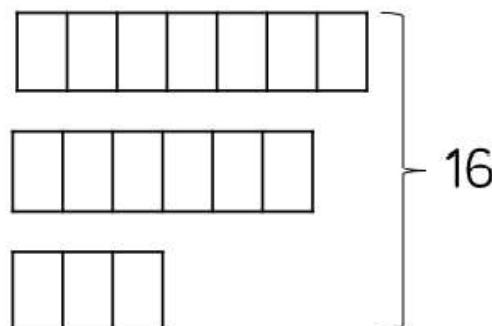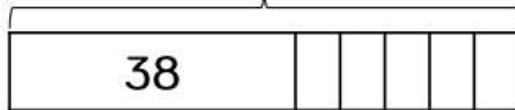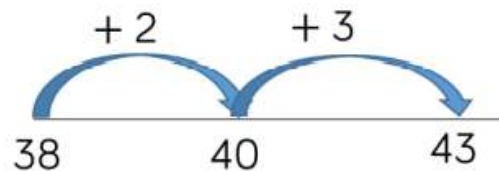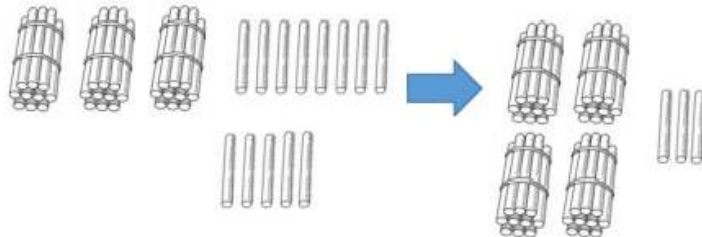| 1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

They should also apply their knowledge of number bonds to add more efficiently e.g. $8 + 5 = 13$ so $38 + 5 = 43$.

Hundred squares and straws can support children to find the number bond to 10.

Addition and Subtraction

Skill: Add two 2-digit numbers to 100	Year: 2/3
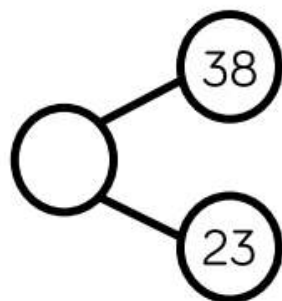
$$38 + 23 = 61$$
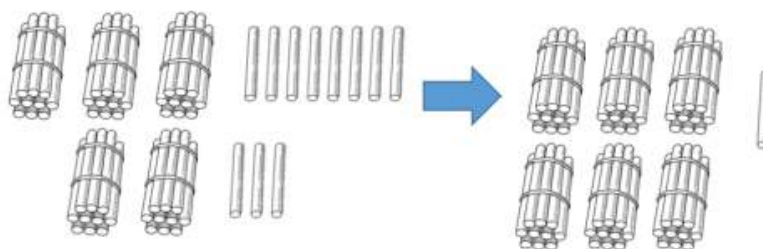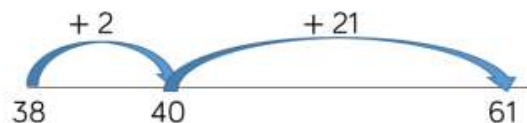
$$\begin{array}{r} 38 \\ + 23 \\ \hline 61 \\ \hline 1 \end{array}$$

At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.

Skill: Add numbers with up to 3 digits	Year: 3
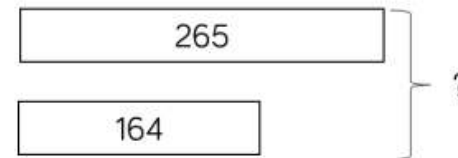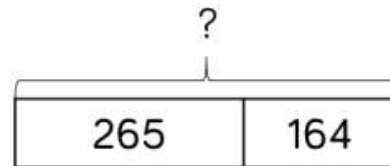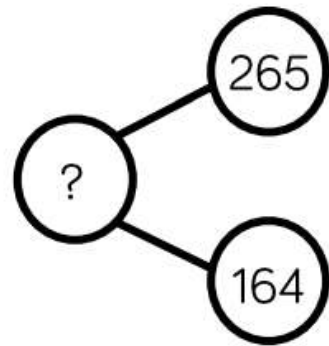
265

?

164
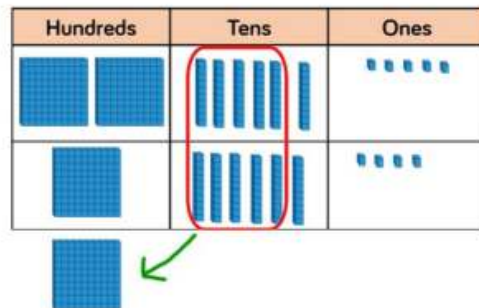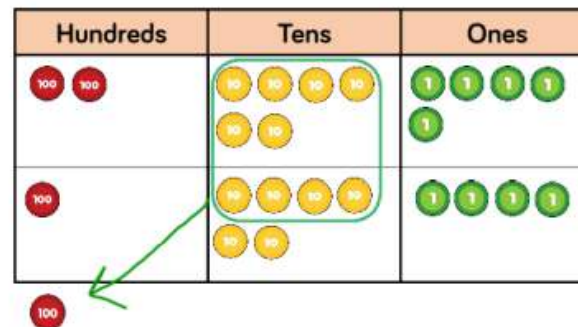
?

265 | 164

265

164

?

$$265 + 164 = 429$$

Hundreds	Tens	Ones

265
+ 164

429
1

Hundreds	Tens	Ones

100 100

100

100

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Addition and Subtraction

Skill: Add numbers with up to 4 digits	Year: 4

1,378

2,148
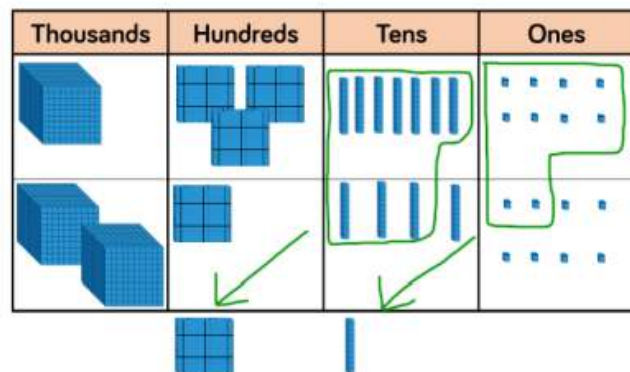
?

?

2,138	1,378

2,138

1,378

?

	1	3	7	8
+	2	1	4	8
	3	5	2	6

1 1

$$1{,}378 + 2{,}148 = 3{,}526$$

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Addition and Subtraction

Skill: Add numbers with more than 4 digits	Year: 5/6

$$104{,}328 + 61{,}731 = 166{,}059$$

HTh	TTh	Th	H	T	O

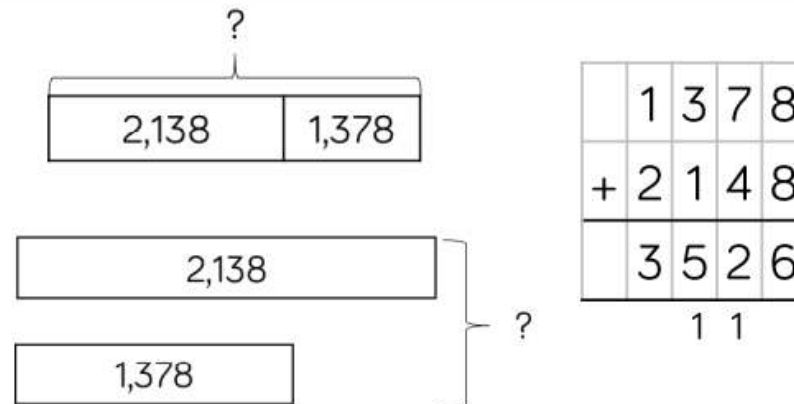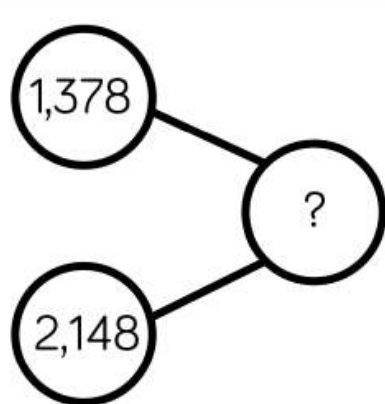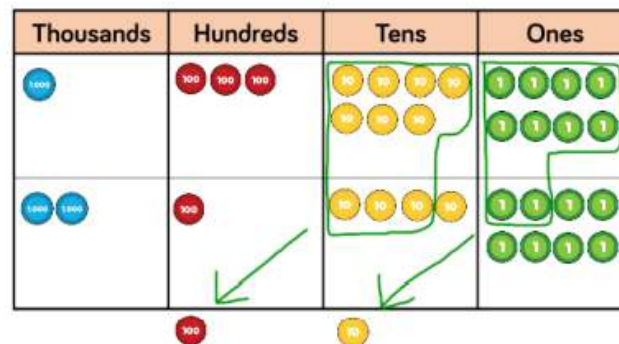| | | 1000 1000 1000 1000 | 100 100 100 | 10 10 | 1 1 1 / 1 1 1 / 1 1 |
| | 10000 10000 10000 / 10000 10000 10000 | 1000 | 100 100 100 / 100 100 100 / 100 | 10 10 10 | 1 |
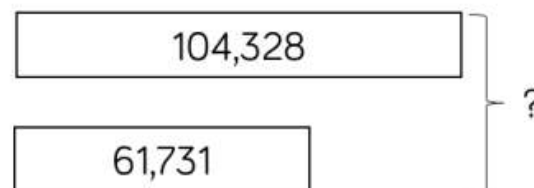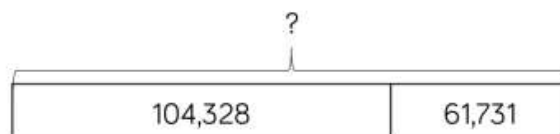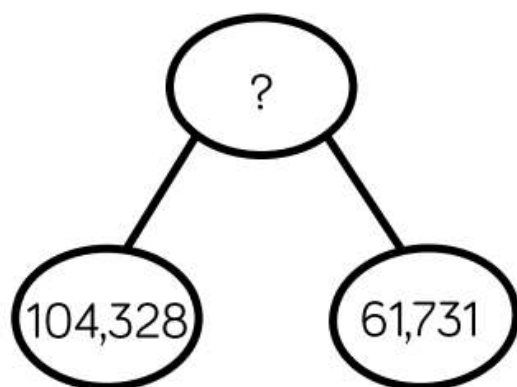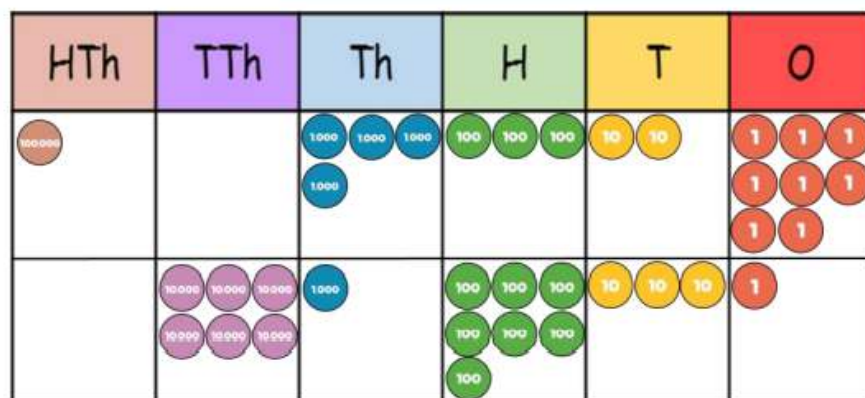
1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9
			1		

Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

Addition and Subtraction

Skill: Add with up to 3 decimal places	Year: 5

2.41   3.65

?

?

3.65   2.41

3.65

2.41

?
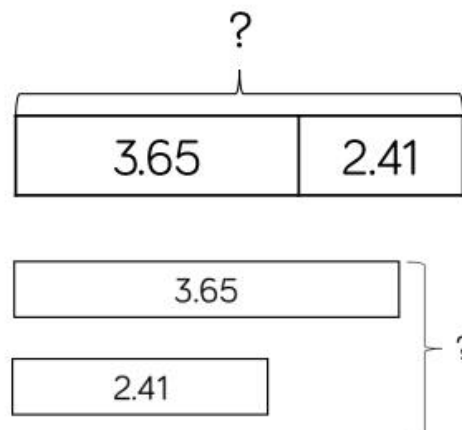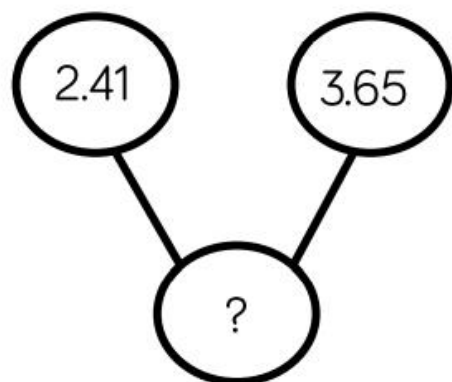
$$3.65 + 2.41 = 6.06$$

$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ 1 \end{array}$$
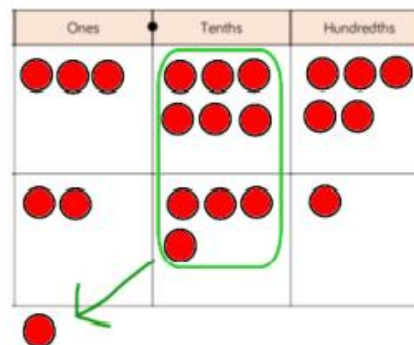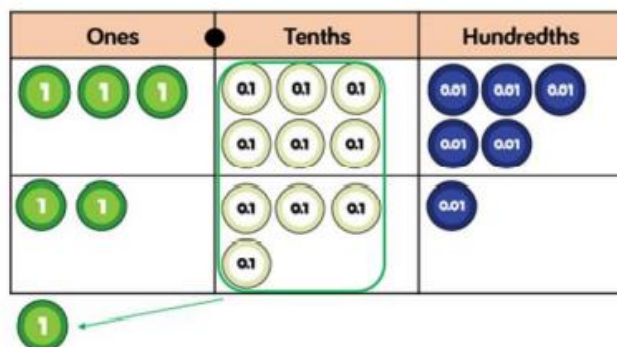
Ones		Tenths		Hundredths	
1 1 1		0.1 0.1 0.1 / 0.1 0.1 0.1		0.01 0.01 0.01 / 0.01 0.01	
1 1		0.1 0.1 0.1 / 0.1		0.01	
1					

Ones	Tenths	Hundredths
●●●	●●● ●●●	●●●
●●	●●● ●	●
●		

Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Addition and Subtraction

Subtraction

Skill	Year	Representations and models	
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead string (20) Number tracks Number lines (labelled) Straws
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters Column addition

Addition and Subtraction

Skill	Year	Representations and models	
Subtract with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Subtract with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

Addition and Subtraction

Skill: Subtract 1-digit numbers within 10	Year: 1
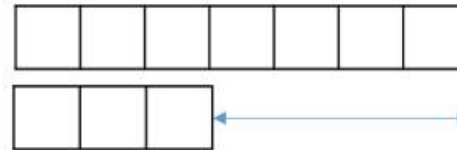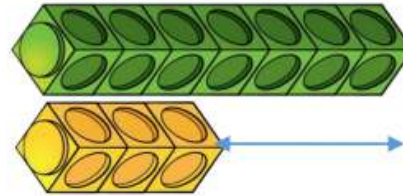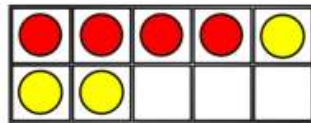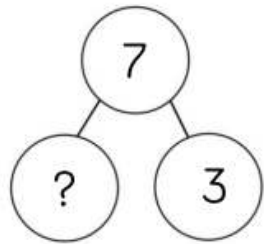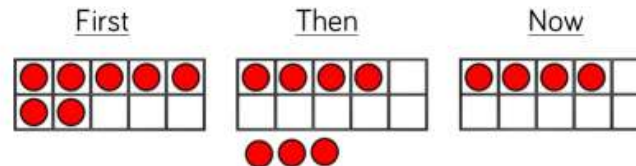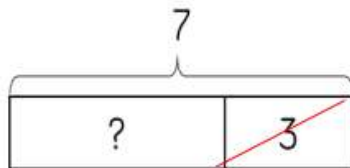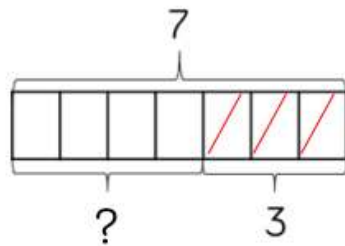
Part-whole models, bar models, ten frames and number shapes support partitioning.

Ten frames, number tracks, single bar models and bead strings support reduction.

Cubes and bar models with two bars can support finding the difference.
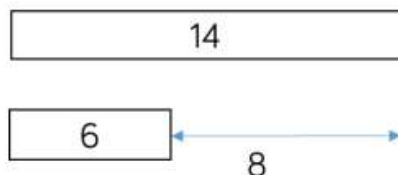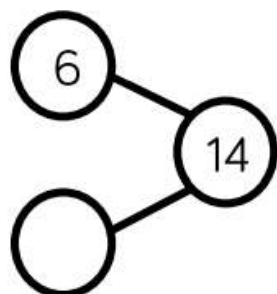
$$7 - 3 = 4$$

First   Then   Now

1 2 3 4 5 6 7 8 9 10

Addition and Subtraction

Skill: Subtract 1 and 2-digit numbers to 20	Year: 1/2

6

14

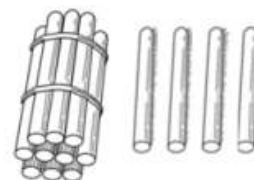14

6

8

14 − 6 = 8

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

14 − 6 = 8

4   2

− 2   − 4

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
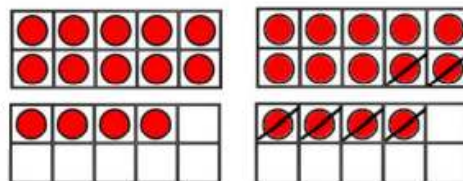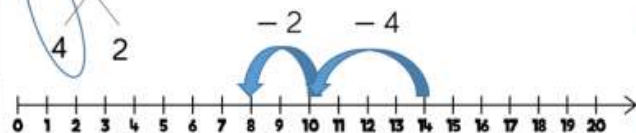
14 − 6 = 8

4   2

When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.
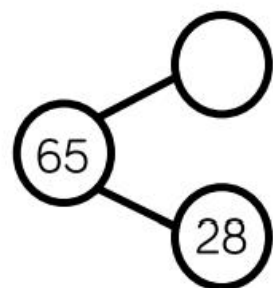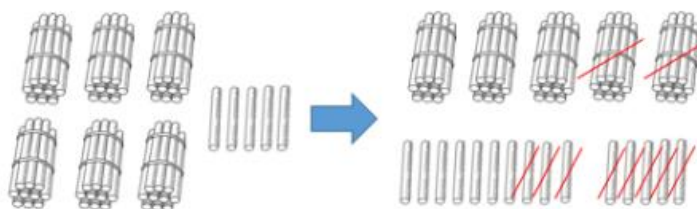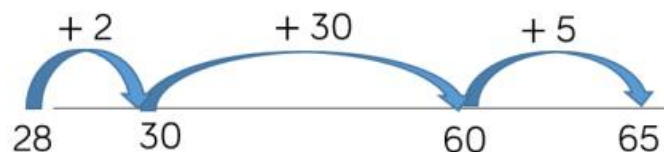
Addition and Subtraction

Skill: Subtract 1 and 2-digit numbers to 100	Year: 2

65

28

65

?	28
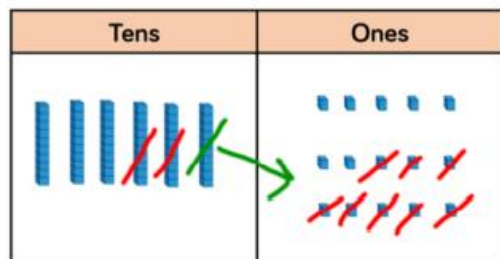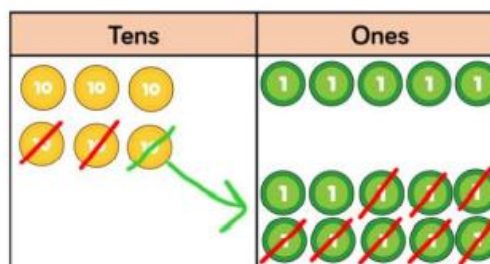
+2   +30   +5

28   30   60   65

$$65 - 28 = 37$$

Tens	Ones

$$\begin{array}{r} ^{5}6^{1}5 \\ -28 \\ \hline 37 \\ \hline \end{array}$$

Tens	Ones

At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Children can also use a blank number line to count on to find the difference. Encourage them to jump to multiples of 10 to become more efficient.

Addition and Subtraction

Skill: Subtract numbers with up to 3 digits	Year: 3

435

273   ?

435

| 273 | ? |

435

| 273 | ← ? → |
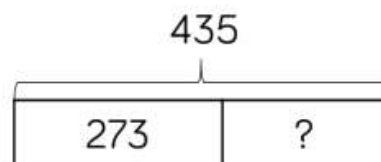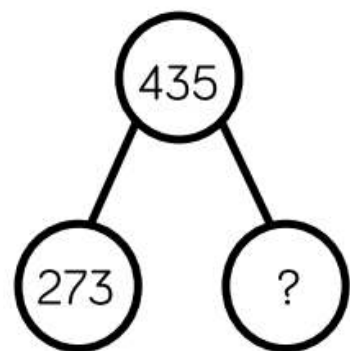
$$435 - 273 = 262$$

Hundreds	Tens	Ones

$$\begin{array}{r} {}^{3}\cancel{4}{}^{1}35 \\ -\ 273 \\ \hline 262 \end{array}$$

Hundreds	Tens	Ones

Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Addition and Subtraction

Skill: Subtract numbers with up to 4 digits	Year: 4

4,357

2,735   ?

4,357

| 2,735 | ? |

4,357

2,735   ?

$$\overset{3\ 1}{\cancel{4}357}$$
$$-\ 2735$$
$$1622$$

4,357 − 2,735 = 1,622

Thousands	Hundreds	Tens	Ones

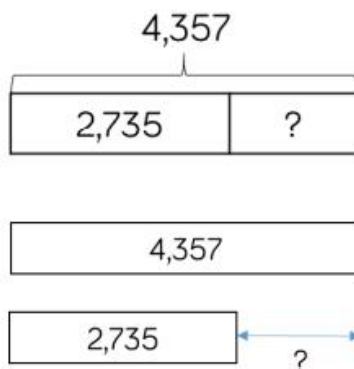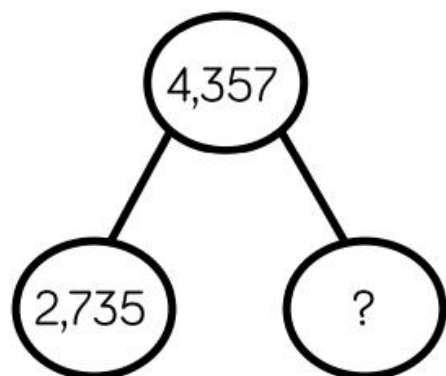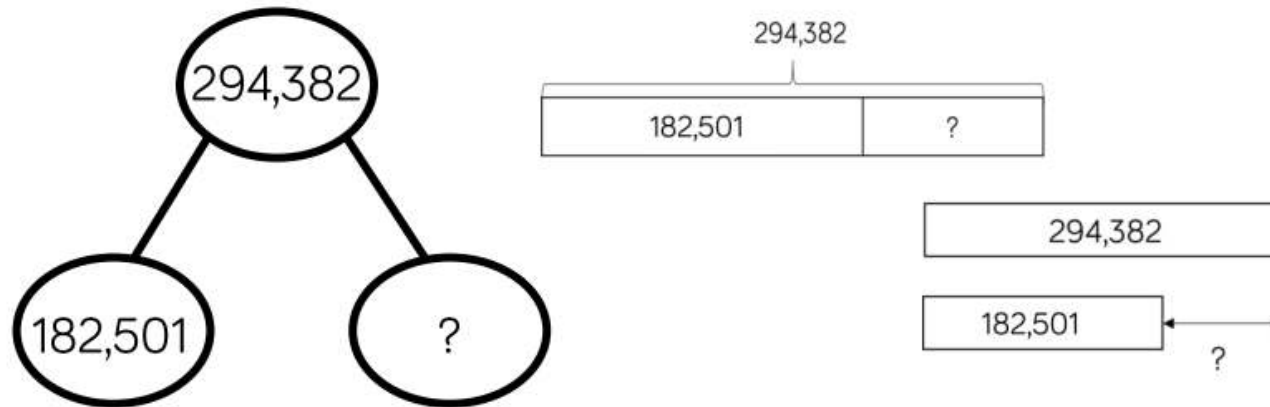| Thousands	Hundreds	Tens	Ones

Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Addition and Subtraction

Skill: Subtract numbers with more than 4 digits	Year: 5/6

294,382

182,501   ?

294,382

182,501   ?

294,382 − 182,501 = 111,881

HTh	TTh	Th	H	T	O

			2	9	³3/	¹3	8	2
−			1	8	2	5	0	1
			1	1	1	8	8	1

Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

Addition and Subtraction

Skill: Subtract with up to 3 decimal places	Year: 5

5.43

2.7   ?   5.43

2.7	?

5.43

2.7	↔

?
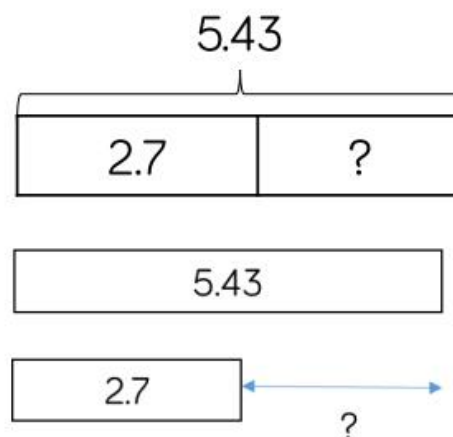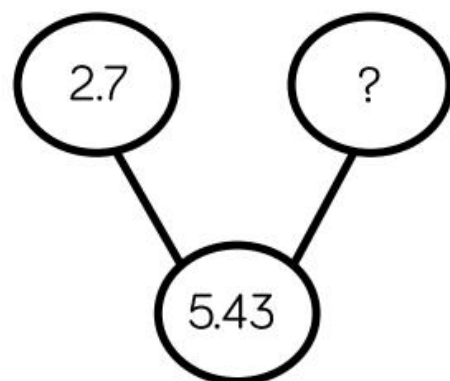
$$5.43 - 2.7 = 2.73$$

$$\begin{array}{r} {}^{4}\;{}^{1} \\ 5.\cancel{4}3 \\ -\,2.7 \\ \hline 2.73 \end{array}$$
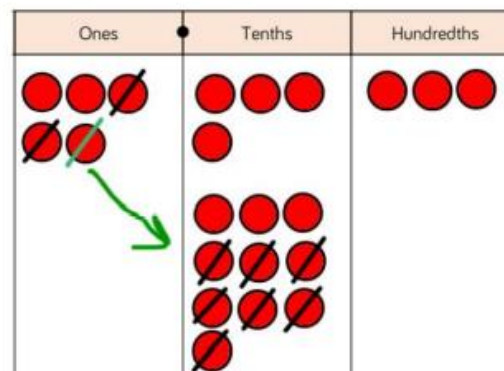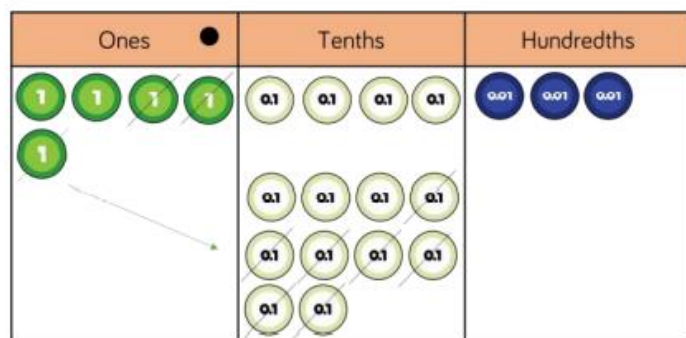
Ones ●	Tenths	Hundredths

Ones ●	Tenths	Hundredths

Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

Addition and Subtraction

Glossary

Addend - A number to be added to another.

Aggregation - combining two or more quantities or measures to find a total.

Augmentation - increasing a quantity or measure by another quantity.

Commutative – numbers can be added in any order.

Complement – in addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000

Difference – the numerical difference between two numbers is found by comparing the quantity in each group.

Exchange – Change a number or expression for another of an equal value.

Minuend – A quantity or number from which another is subtracted.

Partitioning – Splitting a number into its component parts.

Reduction – Subtraction as take away.

Subitise – Instantly recognise the number of objects in a small group without needing to count.

Subtrahend - A number to be subtracted from another.

Sum - The result of an addition.

Total – The aggregate or the sum found by addition.

Addition and Subtraction