

## SUBTRACTION: Y1

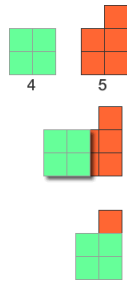
### Understanding the operation and related vocabulary.

#### Understanding the operation

understand subtraction as:

**'taking away'** - removing part of a set & reduction

**'difference'** – comparison & how much more is needed



Read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs ;

$$14-3=11 \quad 9=16-7$$

Solve missing number problems e.g.

$$11-\square=8 \quad \square=13-2 \quad 3=\square-\square$$

#### Vocabulary

Subtraction, subtract, take away, minus, distance between, difference between, more than, minus, less than, equals = same as, most, least, pattern, odd, even, digit,

#### Generalisations

- True or false? Subtraction makes numbers smaller
- When introduced to the equals sign, children should see it as signifying equality. They should become used to seeing it in different positions.

### Mental Calculations

#### Number facts

Recall and use subtraction facts to 10 fluently e.g.

$$6 \text{ minus } 3 \quad 8 \text{ subtract } 2 \quad 4 \text{ less than } 9$$

Know number pairs with a total of 20 and derive related subtraction facts e.g.

$$20+0, 20-1, 20-2, 20-3 \dots$$

#### Mental methods and jottings

Subtract one-digit and two-digit numbers to 20, including zero

Represent and use number bonds within 20

Partition a given number of objects (up to 20) into 2 groups e.g.

Partition 15 into 7 and 8, 9 and 6 ...

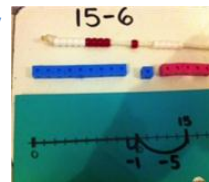
#### Counting back

15-3 (by counting back 3 in ones; 14, 13, 12)

#### With jottings

15 - 6 (by counting back in ones or partitioning 6 to bridge the tens boundary; -5, -1)

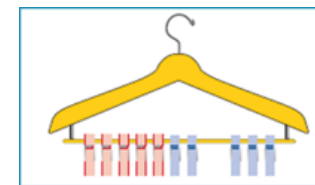
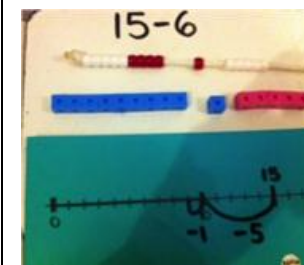
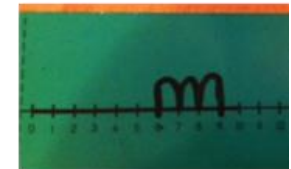
Progress to crossing the tens boundary



### Written Calculations

No formal written layout.

Children will be recording their mathematics using pictorial representations, number lines and mathematical statements.



Children could see the image below and consider, "What can you see here?" e.g.

3 yellow, 1 red, 1 blue.  $3 + 1 + 1 = 5$

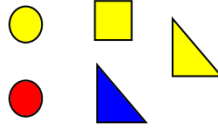
2 circles, 2 triangles, 1

square.  $2 + 2 + 1 = 5$

I see 2 shapes with curved lines and 3 with straight lines.  $5 = 2 + 3$

$5 = 3 + 1 + 1 = 2 + 2 + 1 =$

$2 + 3$



### Some Key Questions

How many more to make...? How many more is... than...?

How much more is...? How many are left/left over? How

many have gone? One less, two less, ten less... How

many fewer is... than...? How much less is...?

What can you see here?

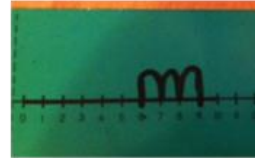
Is this true or false?

### Counting up

9 – 6 (by counting up from 6 to 9 in ones; 7, 8, 9)

### With jottings

19 – 14 (by counting up from 14 to 19 in ones; 15, 16, 17, 18, 19)



### Using known facts and place value

$6 - 4 = 2$  so  $16 - 4 = 12$

## SUBTRACTION: Y2

### Understanding the operation and related vocabulary.

#### Understanding the operation

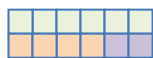
Understand subtraction as:

- taking away
- comparison (finding the difference)
- partitioning a set

Show that subtraction of one number from another cannot be done in any order

Recognise that  $5-3$  is different from  $3-5$

Recognise the inverse relationship between addition and subtraction



Write the related number sentences

$$5+2=7 \quad 2+5=7 \quad 7=5+2 \quad 7=2+5$$

$$7-2=5 \quad 7-5=2 \quad 2=7-5 \quad 5=7-2$$



Solve missing number problems e.g.

$$27 - \square = 17 \quad \square = 21 - 4 \quad 10 = \square - \square$$

#### Vocabulary

Subtraction, subtract, take away, difference, difference between, minus, Tens, ones, partition, near multiple of 10, tens boundary, less than, one less, two less... ten less... one hundred less, more, one more, two more... ten more... one hundred more

### Mental Calculations

#### Number facts

Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100 e.g.

$$15 \text{ subtract } 8 \quad 4 \text{ less than } 12 \quad 80 \text{ minus } 30 \quad 90 \text{ take } 50$$

Know complements to the next multiple of 10 e.g.

$$52 + \square = 60 \quad 52 + \square = 80$$

Know pairs of multiples of 10 with a total of 100 and derive related subtraction facts e.g.

$$100 - 10, 100 - 20, 100 - 30 \dots$$

#### Mental methods and jottings

Subtract numbers using concrete objects, pictorial representations, and mentally, including:

- \* a two-digit number and ones
- \* a two-digit number and tens
- \* two two-digit numbers

#### Counting back

$57 - 20$  (by counting back in tens; 47, 37)

#### With jottings

$57 - 23$  (by partitioning the second number and counting back; -20, -3)

*Begin by not crossing the tens boundary*

$42 - 17$  (by partitioning the second number and counting back; -10, -2, -5)

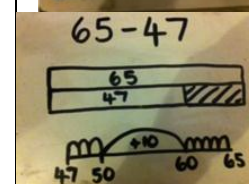
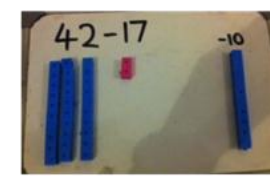
*Progress to crossing the tens boundary*

*See image on next page*

### Written Calculations

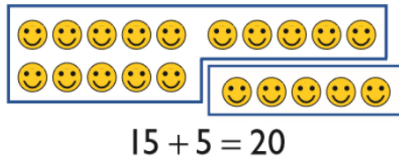
No formal written layout.

Children will be recording their mathematics using pictorial representations, number lines and mathematical statements.



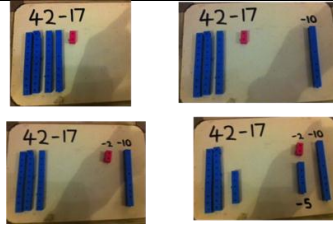
### Generalisation

- Noticing what happens when you count back in tens (the digits in the ones column stay the same)
- Odd – odd = even; odd – even = even; etc
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems. This understanding could be supported by images such as this.



### Some Key Questions

How many more to make...? How many more is... than...?  
How much more is...? How many are left/left over? How many fewer is... than...? How much less is...?  
Is this true or false?  
If I know that  $7 + 2 = 9$ , what else do I know? (e.g.  $2 + 7 = 9$ ;  $9 - 7 = 2$ ;  $9 - 2 = 7$ ;  $90 - 20 = 70$  etc).  
What do you notice? What patterns can you see?



### Counting up

31 - 28 (by counting up from 28 by bridging the tens boundary; +2, +1)

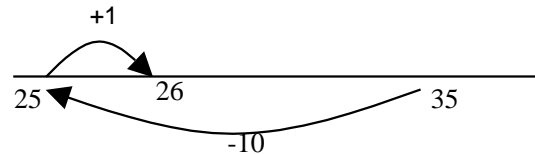
### With jottings

65 - 47 (by counting up from 47 by bridging the tens boundary; +3, +10, +5)



### Adjusting

35 - 9 (by subtracting 10 and adding 1)



### With jottings

35 - 19 (by subtracting 20 and adding 1)

### Using known facts and Place Value

57 - 4  
 $7 - 4 = 3$  so  $57 - 4 = 53$

### Estimating

check calculations by subtracting in a different way  
solve  $16 - 9$  by  $16 - 10 + 1$   
check by counting up from 9 to 16

## SUBTRACTION: Y3

### Understanding the operation and related vocabulary.

#### Understanding the operation

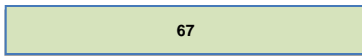
Continue to develop understanding of subtraction

Understand that the principles of the commutative and associative laws do not apply to subtraction

Recognise that 41-35 is different from 35-41

Recognise that if calculating 19-6-3 the order matters (we cannot calculate 6-3 first)

Understand the inverse relationship between addition and subtraction



Write the related number sentences

45+22=67 22+45=67 67=45+22 67=22+45

67-22=45 67-45=22 22=67-45 45=67-22

Solve missing number problems e.g.

62 - □ = 19   □ = 68 - 54   □ - □ = 25

59 + 34 = 100 - □   45 < □ - 6   □ - □ > 54 + 9

#### Vocabulary

Hundreds, tens, ones, estimate, partition, recombine, difference, decrease, near multiple of 10 and 100, inverse, rounding, column subtraction, exchange  
See also Y1 and Y2

### Mental Calculations

#### Number facts

Continue to recall and use subtraction facts to 20 fluently, and derive and use related facts beyond 100 e.g.

16 subtract 9, 150 minus 70, the difference between 80 and 170, 30 fewer than 110

Know pairs of two-digit numbers with a total of 100 and derive related subtraction facts e.g.

100-79, 100-43, 100-12 ...

#### Mental methods and jottings

subtract numbers mentally, including:

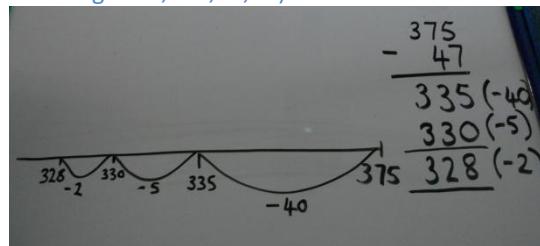
- \* a three-digit number and ones
- \* a three-digit number and tens
- \* a three-digit number and hundreds
- \*

#### Counting Back (sequencing)

164 - 40 (by counting back in tens; 154, 144, 134, 124)

With Jottings:

375 - 47 (by partitioning the second number and counting back; -40, -5, -2)

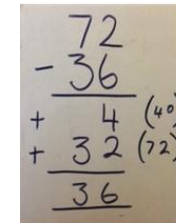


#### Counting up

102 - 97 (by counting up from 97, bridging the hundreds boundary; +3, +2)

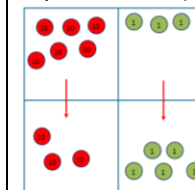
### Written Calculations

Continue to use number lines to show the difference with 3 - digit numbers but begin to prepare for decomposition, using smaller numbers to begin with.



#### Expanded decomposition

Introduce expanded column subtraction with no decomposition, modelled with place value counters (Dienes could be used for those who need a less abstract representation) when the child is ready for this method.



$$\begin{array}{r} 908 \\ - 305 \\ \hline 603 \end{array}$$

For some children this will lead to exchanging, modelled using place value counters or dienes

72 - 36 =    163 - 48



### Generalisations

Noticing what happens to the digits when you count in tens and hundreds.

Odd – odd = even etc (see Year 2)

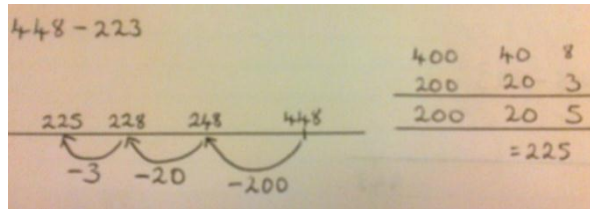
Inverses and related facts – develop fluency in finding related addition and subtraction facts.

Develop the knowledge that the inverse relationship can be used as a checking method.

### Key Questions

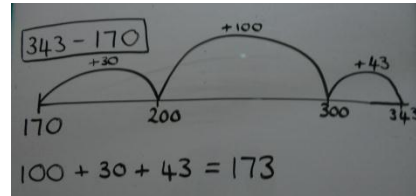
What do you notice? What patterns can you see?

When comparing two methods alongside each other: What's the same? What's different? Look at this number in the formal method; can you see where it is in the expanded method / on the number line



### With jottings

343 – 170 (by counting up from 170, bridging the hundreds boundary; +30, +100, +43)

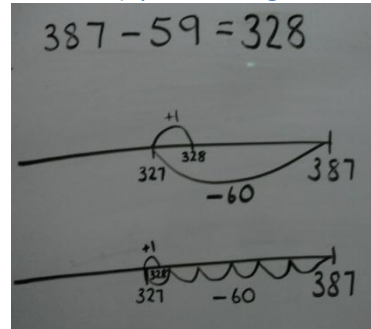


### Adjusting:

234 – 99 (by subtracting 100 and adding 1)

### With Jottings:

387 – 59 (by subtracting 60 and adding 1)



### Using Known Facts And Place Value:

268 – 5

8-5=3 so 268-5=263

### Estimating

Estimate the answer to a calculation

163-48 is approximately 150-50

Use inverse operations to check answers

check 102-97=5 with 97+5=102

Use equivalent calculations to check answers



## SUBTRACTION: Y4

### Understanding the operation and related vocabulary.

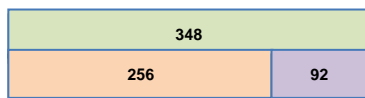
#### Understanding the operation

Continue to understand that the principles of the commutative and associative laws do not apply to subtraction

recognise that  $92-56$  is different from  $56-92$

recognise that if calculating  $73-27-8$  the order matters (we cannot calculate  $27-8$  first)

Continue to understand the inverse relationship between addition and subtraction



Write the related number sentences

$$256+92=348 \quad 92+256=348 \quad 348=256+92 \quad 348=92+256$$

$$348-256=92 \quad 348-92=256 \quad 92=348-256 \quad 256=348-92$$

Continue to solve missing number problems e.g.

$$456-\square=210 \quad \square=300-176 \quad \square-\square=125$$

$$589+318=1000-\square \quad 450<\square-60 \quad \square-\square>345+199$$

#### Vocabulary

add, addition, sum, more, plus, increase, sum, total, altogether, double, near double, how many more to make..? how much more? ones boundary, tens boundary, hundreds boundary, thousands boundary, tenths boundary, hundredths boundary, inverse, how many more/fewer? Equals sign, is the same as.

#### Generalisations

Investigate when re-ordering works as a strategy for subtraction. eg.  $20-3-10=20-10-3$ , but  $3-20-10$  would give a different answer.

### Mental Calculations

#### Number facts

Continue to use knowledge of subtraction facts and place value to derive related facts e.g.

8000 subtract 3000, 1700 minus 800, the difference between 700 and 1400, 300 fewer than 1200

Know complements to the next multiple of 100 e.g.

$$367 + \square = 400 \quad 739 + \square = 800$$

#### Mental methods and jottings

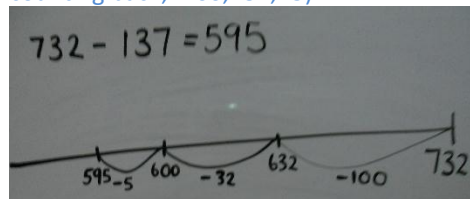
Continue to practise mental methods of subtraction with increasingly large numbers.

#### Counting Back (Sequencing):

564 – 150 (by partitioning the second number and counting back; -100, -50)

With Jottings:

732 – 137 (by partitioning the second number and counting back; -100, -32, -5)



#### Counting Up:

607 – 288 (by counting up from 288, bridging the hundreds boundary; +12, +7)

With Jottings:

6070 – 4987 (by counting up from 4987, bridging the thousands boundary; +13, +1070)

### Written Calculations

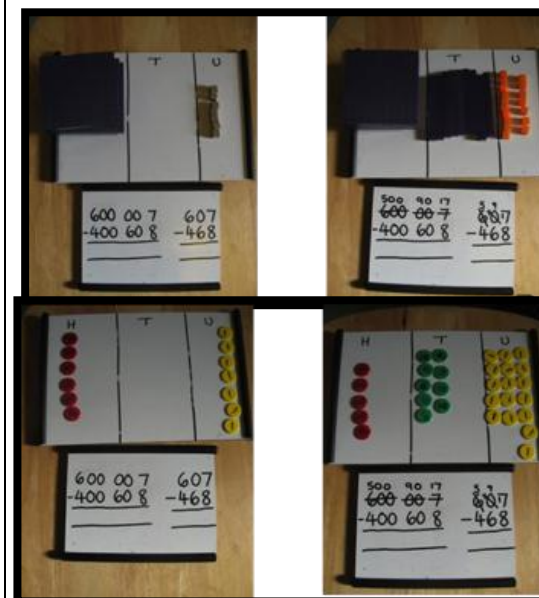
Subtract numbers with up to 4 digits using the formal written method of columnar subtraction where appropriate

Subtract decimals to 2 decimal places (in the context of money or measures)

By Year 4, most children will be confident using expanded decomposition, with the support of practical equipment and models and images and will be able to use this method for HTU – HTU and ThHTU – ThHTU ( $3062 - 2581$ )

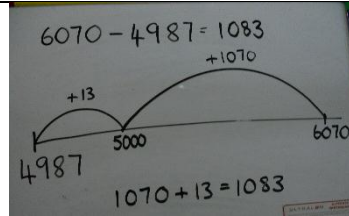
Some children will have moved on further and will no longer need to use the expanded method.

$$607 - 468 =$$



**Some Key Questions**

What do you notice?  
What's the same? What's different?  
Can you convince me?  
How do you know?

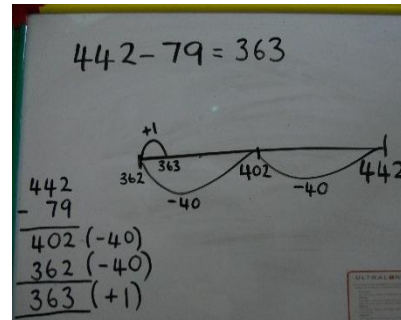


**Adjusting:**

1487 - 199 (by subtracting 200 and adding 1)

**With Jottings:**

442 - 79 (by subtracting 80 (-40, -40) and adding 1)



**Using Known Facts And Place Value:**

7000-600

1000-600=400 so 7000-600=6400

**Estimating:**

Estimate the answer to a calculation

3062-2581 is approximately 3000-2500

Use inverse operations to check answers

check  $564 - 150 = 414$  with  $414 + 150 = 564$

Use equivalent calculations to check answers



## SUBTRACTION: Y5

### Understanding the operation and related vocabulary.

#### Understanding the operation

Continue to solve missing number problems

$$6.5 - \square = 2.3 \quad \square - 3 = 0.8 \quad \square - \square = 1.2$$

$$5.4 + 2.7 = 10.3 - \square \quad 5.2 < \square - 0.9 \quad \square - \square > 7.2 - 1.9$$

Begin to use brackets

$$(10-3) \times 6 = \square \quad 10 - (0.5 \times 7) = \square$$

#### Vocabulary

tens of thousands boundary,

Also see previous years

#### Generalisation

Sometimes, always or never true? The difference between a number and its reverse will be a multiple of 9.

What do you notice about the differences between consecutive square numbers?

[Investigate  \$a - b = \(a-1\) - \(b-1\)\$  represented visually.](#)

#### Some Key Questions

What do you notice?

What's the same? What's different?

Can you convince me?

How do you know?

### Mental Calculations

#### Number facts

Continue to use knowledge of subtraction facts and place value to derive related facts with numbers to one decimal place

1.2 subtract 0.7, 1.8 minus 0.9, the difference between 2 and 1.3, 0.3 fewer than 1.7

Know complements to 1

$$0.78 + \square = 1 \quad 0.52 + \square = 1$$

Recall pairs of three-digit numbers with a total of 1000 and derive related subtraction facts

1000-453, 1000-239, 1000-712 ...

#### Mental methods and jottings

Subtract numbers mentally with increasingly large numbers

Subtract tenths, and one-digit whole numbers and tenths

#### Counting Back (sequencing):

4.7 - 1.5 (by partitioning the second number and counting back; -1, -0.5)

With jottings:

19.2 - 2.7 (by partitioning the second number and counting back; -2, -0.2, -0.5)

### Written Calculations

Subtract whole numbers with more than 4 digits, including using formal written methods

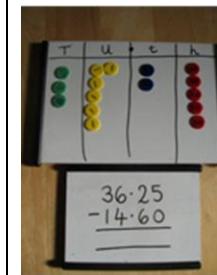
Subtract decimals, including a mix of whole numbers and decimals and decimals with different numbers of decimal places

#### DECOMPOSITION:

Some children may still need the support of practical apparatus and models and images, though most children will no longer need to use the expanded method and should be confident using the compact method, having an understanding of the value of each digit. They should be confident using this method for decimals too.

$$25\ 034 - 7185$$

$$36.25 - 14.6$$

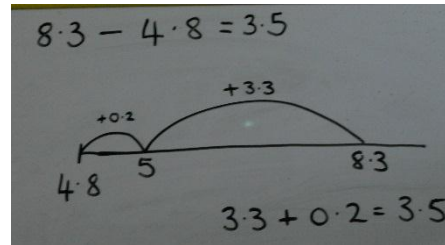


**Counting up:**

7.2 – 6.8 (by counting up from 6.8 by bridging the units boundary; +0.2, +0.2)

**With jottings:**

8.3 – 4.8 (by counting up from 4.8 by bridging the units boundary; +0.2, +3.3)

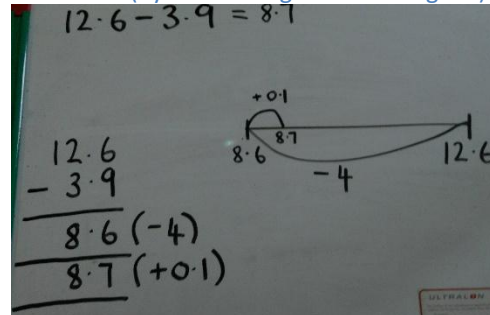


**Adjusting:**

8.3 – 1.9 (by subtracting 2 and adding 0.1)

**With jottings:**

12.6 – 3.9 (by subtracting 4 and adding 0.1)



**Using known facts and place value:**

15 – 0.3

1-0.3=0.7 so 15-0.3=14.7

**Estimating**

Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

25 034 – 7185 is approximately 25 000 – 7000

Continue to use appropriate strategies to check answers

check  $4.7 - 1.5 = 3.2$  with  $3.2 + 1.5$

SUBTRACTION: Y6		
Understanding the operation and related vocabulary.	Mental Calculations	Written Calculations
<p><b>Understanding the operation</b> Use their knowledge of the order of operations Understand that when there are no brackets in an expression, do multiplication or division before addition or subtraction Understand that if the operations are at the same level of priority, work out the example from left to right Continue to solve missing number problems <math>0.63 - \square = 0.32</math> <math>\square = 0.5 - 0.33</math> <math>\square - \square = 0.11</math></p> <p><math>0.89 - 0.4 = 1.3 - \square</math> <math>0.75 &lt; \square - 0.06</math> <math>\square - \square &gt; 0.82 - 0.09</math> Explore the order of operations using brackets compare <math>14 - (3 + 5)</math> with <math>(14 - 3) + 5</math></p> <p><b>Vocabulary</b> See previous years</p> <p><b>Generalisations</b> Order of operations: brackets first, then multiplication and division (left to right) before addition and subtraction (left to right). Children could learn an acrostic such as PEMDAS, or could be encouraged to design their own ways of remembering. Sometimes, always or never true? Subtracting numbers makes them smaller.</p> <p><b>Some Key Questions</b> What do you notice? What's the same? What's different? Can you convince me? How do you know?</p>	<p><b>Number facts</b> Continue to use knowledge of subtraction facts and place value to derive related facts with numbers to two decimal places <math>3.09</math> subtract <math>0.04</math>, <math>0.16</math> minus <math>0.08</math>, the difference between <math>0.2</math> and <math>0.12</math>, <math>0.06</math> fewer than <math>0-19</math> Know complements to the next whole number <math>4.83 + \square = 5</math> <math>7.125 + \square = 8</math></p> <p><b>Mental methods and jottings</b> Perform mental calculations, including with mixed operations, large numbers and decimals  Calculate intervals across zero e.g. the drop in temperature from <math>+5</math> to <math>-3</math></p> <p><b>Counting Back (Sequencing):</b> <math>7.87 - 2.03</math> (by partitioning the second number and counting back; <math>-2</math>, <math>-0.03</math>) <b>With Jottings:</b> <math>16.3 - 3.55</math> (by partitioning the second number and counting back; <math>-3</math>, <math>-0.3</math>, <math>-0.25</math>)</p> <p><b>Counting up:</b> <math>6.14 - 5.76</math> (by counting up from <math>5.76</math> by bridging the units boundary; <math>+0.24</math>, <math>+0.14</math>) <b>With Jottings:</b> <math>8.3 - 4.54</math> (by counting up from <math>4.54</math> by bridging the units boundary; <math>+0.46</math>, <math>+3.3</math>)</p> <p><b>Adjusting:</b> <math>7.65 - 0.99</math> (by subtracting 1 and adding 0.01)</p>	<p>Practise subtraction for larger numbers, using formal written methods  Continue to practice subtraction calculations with decimals (up to 3 decimal places)</p> <p><b>DECOMPOSITION:</b> By this stage, children should be confident using the compact method, for decimals up to 3 places. <math>500\ 203 - 34\ 456</math> <span style="float: right;"><math>60.31 - 17.884</math></span></p>

With Jottings:

15.4 – 3.09 (by subtracting 3.1 and adding 0.01)

Using Known Facts And Place Value:

1.63 – 0.8

16-8=8 so 1.63-0.8=0.83

Estimating:

Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

60 .31 – 17.884 is approximately 60-18

Continue to use appropriate strategies to check answers

check  $6.7 - 0.55 = 6.15$  with  $6.15 + 0.55$