Addition Strategies

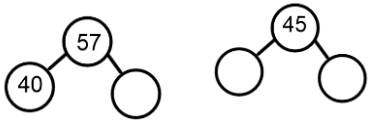
Place Value

Adding 1s,10s to a 1 or 2 digit number. Use of part whole models and place value charts to show addition where no boundaries crossed:

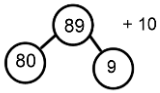
20+3=
___= 89+10
99+10=
68+20=
___= 21+40
47+50=

Part Whole Model/ PV Chart

Partition numbers to see which part will change following the calculation. Also, partition in as many ways as you can (50+7, 40+17,30+27 etc) or give part whole with one of the parts missing.



89 + 10 =



OR

t	o
8	9

Unitising

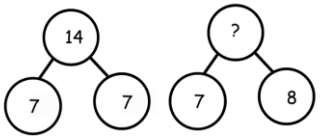
Use of unitising language:

3 ones +4 ones = 7 ones
3 tens +4 tens = 7 tens

Known facts

(number bonds, near bonds, doubles, near doubles)

7+8=



Addition of 3 single digits:

8+5+4; 4+5+6; 15+3+3; 5+10+5.

Unitising

Addition of multiples of 10:

4 ones + 3 ones = 7 ones
3 tens +4 tens = 7 tens
40+30
Also,
20+30+50.
10+40+20.

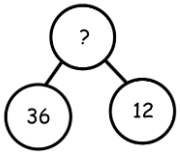
Addition of single digits and multiples of 10:

3+30+3
40+30+2
20+5+3+30

Exploring Relationships

__-12=36

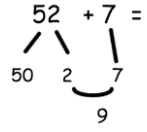
?	
36	12

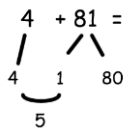


Partitioning

Single digit to 2-digit number (no crossing):

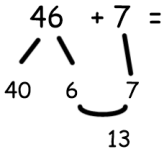
22+7
5+32
99+1





Single digit to 2-digit number (no crossing):

46+7
37+5
7+84
97+5
98+4.



Addition of 2 two digit numbers (no crossing):

54+22
84+12

Addition of 2 two digit numbers (bond to 10):

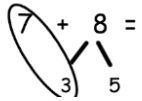
67+33
23+37
36+24
69+11

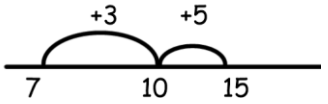
Addition of 2 two digit numbers (crossing tens) – some examples crossing 100. 43+38; 55+17; 17+48; 52+29; 22+22.

Bridging

2 single digit numbers:

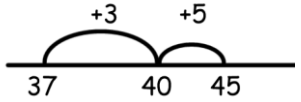
9+ 4
9+5
7+8
8+6.





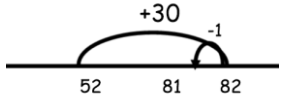
Single digit to 2-digit number:

46+7
37+5
7+84
97+5
98+4.



Compensations/Adjustment (manipulation of numbers)

6+9=
52+29



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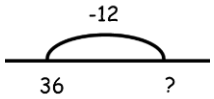
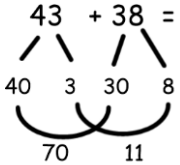
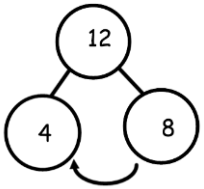
<table>
<tr>
<td>Number Sequences

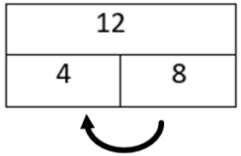
___, __,57, 67, ___ etc.</td>
<td> 

Write the inverse calculation to check it. (Known facts to be reused in partitioning and bridging strategies).</td>
<td> 
</td>
<td>Manipulation

Mentally move one digit to calculate

4+8= ___+7
4+8> ___+7
4+8< ___+7

Relies on previous use of visuals with concrete apparatus to show how parts of numbers can be moved to make equivalent calculations:
4+8=
5+7=
6+6=
7+5=
 

 
</td>
</tr>
</table>

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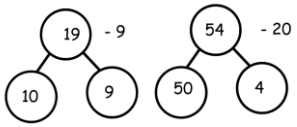
Subtraction Strategies

Place Value

Subtracting 1s,10s from a 1 or 2 digit number. Use of part whole models and place value charts to show subtraction where no boundaries crossed:

6-4
19-9
18-8



54-20
39-20
87-40
92-60
63-10-10.

t	o
5	4

(Or counters/dienes drawn in).

Known facts

___+5=9
__+8=20

Unitising

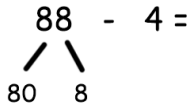
8 ones – 1 one = 7 ones
8 tens- 1 ten= 7 tens.

Subtracting multiples of ten:
80-10
10+20
90-80
100-10
50+__=80
20+__=70
50-__=20.

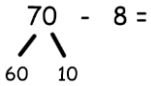
Partitioning

Single digit from 2-digit number

17-6
88-4
39-8
__=15-2
__=19-5

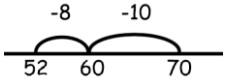


Subtraction of single digit from multiple of ten.(Needed for bridging):
70-8.
100-__=52.



Also draw place value counters and show on 100 squares.

Subtraction of 2 two digit numbers (bond to 10):
70-18

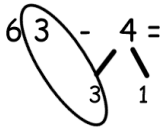


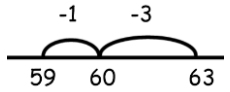
(Also draw place value counters).

Subtraction of 2 two digit numbers (no crossing):
86-21
85-21
64-11.
Also use place value charts.

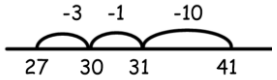
Bridging

Subtraction of single digit from 2 digit.
12-7
18-6
63-4
43-5
54-8





Subtraction of 2 two digit numbers (crossing tens):
73-19
62-54
71-14
91-48
59-15
74-47.



Counting on (difference):
Subtraction of 2 two digit numbers (crossing tens):
73-19
62-54
71-14
91-48
59-15
74-47.

Take 24 from the start of the bar model/ number line and count on.

41	
24	

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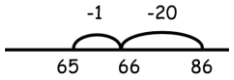
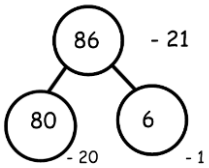
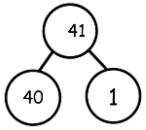
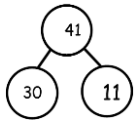


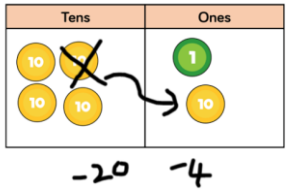


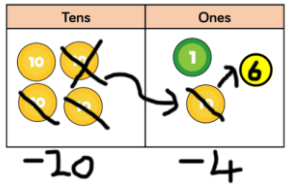
Subtraction of 2 two digit numbers (crossing tens):
41- 24
73-19
62-54
71-14
91-48
59-15
74-47.

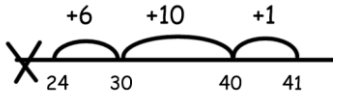
41-24 =





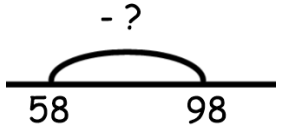


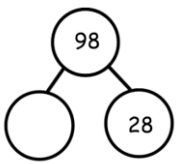


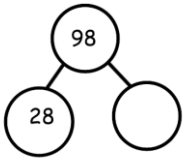


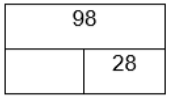
Exploring inverse relationships:
Through addition, subtraction work, use range of visuals to explore subtraction as counting back and counting on (difference).

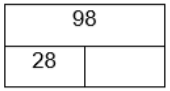
10-__=2;
3+__+6=16
98-__=28;
56-__=51.
65+__=93
28+__=35











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Multiplication Strategies

Place Value and known facts (see also scaling)

Multiplying by 0 and by 1.
2 x0; 1 x 9

8x10
10x9=
6x10=
3x10=
10x10=

How many ways can you solve?

___ x ___= 40.

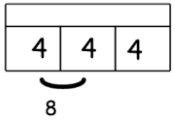
Which numbers couldn't it be? Why not?

See Times Table Programme of Study for further examples.

Doubles/Halving/Tripling

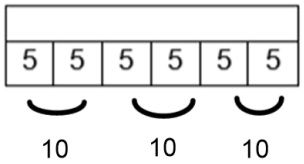
7x2=
3x2=
6x2=
Show link to doubling on arrays.

Tripling as well as counting in 3s: Double then bridge to add on last multiple.
3x3
8x3
6x3.



Find, x5 by using relationship to 10s.
5x8
5x12

5x6



10x5=
20x5=

Partitioning (Distributive Law)

Use arrays to explore

3 x 2 + 2 x 2 =

How many ways can you solve?

7x5= ___x 5 and ____x 5.

Scaling and Associated Language

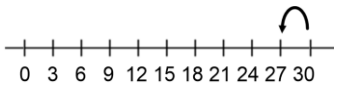
Across tables, use language of scaling.

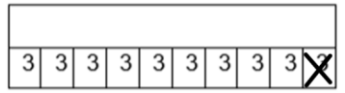
3x10 means 10 lots of 3 or 3 ten times. Show both on part whole and bar models and number lines (See Times table Programme of Study).

Make 3 ten times bigger.
Make 6 twice the size/twice as big.
Show me 4 five times. Write the calculation.

Compensation

9 x 8, use counting stick, draw number line and use bar models and part whole models to show relationship between 10x and 9x. Use same strategy to help find 11x or 12x.





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Division Strategies

Place value and known facts

Explore both grouping/Sharing (See Times Table Programme of Study).

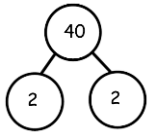
35÷1
50 ÷1
5÷5
10÷10

40÷10=
80÷10=
120÷10=

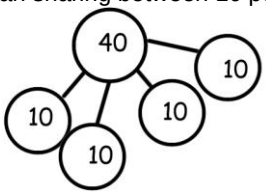
(Use of unitising language – 12 tens ÷10).

Grouping/Sharing

Begin to make decision about whether to share or group in arithmetic situation.
E.g. E.g. 40 ÷ 2, more efficient to share (halve) rather than group in twos.



.
E.g. 40 ÷ 10. More efficient to take away groups of 10 rather than sharing between 10 people.



Halving

Methods should involve discussion about division by 2 as halving.
2÷2=
8÷2=
12÷2=
14÷2=
Use arrays, part whole model and bar models.

Scaling and Associated Language

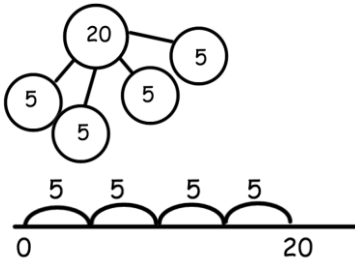
Divide by 10, make 10 times smaller/10 times as small.
Divide by 2, half as many/much.

40 ÷10
80 ÷10
120 ÷10

Explore relationships with part whole models, bar models and number lines.

___ ***x 5 = 20***

(How many groups of five are in 20).



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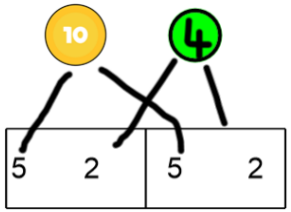
Fractions Strategies.

Half of numbers to 20.
Halve the ten then halve the ones.

½ of 14
½ of 16



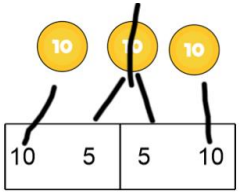
Halves of multiples of 10.

$\frac{1}{2}$ ***of 20***

$\frac{1}{2}$ ***of 30***

$\frac{1}{2}$ ***of 40***

$\frac{1}{2}$ ***of 90***



Find quarters by halving and halving again.

16			
8		8	
4	4	4	4

Use bar model to find two quarters or three quarters.

$\frac{3}{4}$ ***of 16;***
$\frac{3}{4}$ ***of 20;***
$\frac{2}{4}$ ***of 36.***

16			
8		8	
4	4	4	4

$\frac{1}{4}$ of 100=

$\frac{3}{4}$ of 100=

$\frac{1}{3}$ of 6
$\frac{1}{3}$ of 12
$\frac{1}{3}$ of 30
$\frac{1}{3}$ of 21

Share out 12 between 3 (count rows in threes to check).

12		

x x x
x x x
x x x
x x x

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