

Number – addition and subtraction

Number – multiplication and division

Doubles of numbers to 10
Near doubles
Bridging
Compensating

recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Play games, chant, test etc to increase speed of recalling facts to 20.
Make models and images to display facts.
Investigate related facts to 100 and repeat above.

including:
• a two-digit number and ones or tens

Counting on
15 + 2 "Put 15 in your head, 16, 17:"

Adding near numbers and adjusting
33 + 9 = 33 + 10 - 1

Partition number and recombine
27 + 9 = 20 + 7 + 9
= 20 + 16
= 36

Count on by splitting units to make next multiple of ten
36 + 8 = 36 + 4 + 4
= 40 + 4
= 44

Hundred Square
17 + 30

• two two-digit numbers

Use empty number lines to add two 2 digit numbers, by counting on in multiples of ten then multiples of one.

63 + 16 = 79

Partition into tens and ones and recombine
12 + 23 = 10 + 2 + 20 + 3
= 10 + 20 + 2 + 3
= 30 + 5
= 35

Hundred Square
32 + 23

Refine to partitioning the second number only:
23 + 12 = 23 + 10 + 2
= 33 + 2
= 35

add numbers using concrete objects, pictorial representations, and mentally,
• adding three one-digit numbers
Use knowledge of adding, for example number bonds first or largest numbers first.
3 + 9 + 7 = (3 + 7) + 9
= 10 + 9 =
19

recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Play games, chant, test etc to increase speed of recalling facts to 20. Make models and images to display facts.
Investigate related facts to 100 and repeat above.

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

• a two-digit number and ones or tens

Counting back
63 - 20 "Put 63 in your head, 53, 43."

Use unprepared numbered lines to subtract, by counting back in units:

16 - 4 = 12

Hundred Square
43 - 30

• two two-digit numbers

Use known number facts and place value to subtract (partition second number only)

37 - 12 = 37 - 10 - 2
= 27 - 2
= 25

Find a small difference by counting up

42 - 39 = 3

Subtract mentally a number near 10 to or from a two-digit number

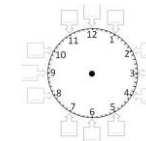
35 - 19 = 35 - 20 + 1

recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

Play games, chant, test etc to increase speed of recalling facts to 20. Make models and images to display facts.
Investigate related facts to 100 and repeat above.

connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face

H	T	U
	1	0
	2	0
	3	0
	4	0

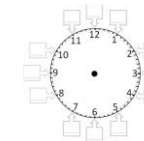


recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

Play games, chant, test etc to increase speed of recalling facts to 20. Make models and images to display facts.
Investigate related facts to 100 and repeat above.

connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face

H	T	U
	1	0
	2	0
	3	0
	4	0



relate multiplication to arrays and to repeated addition using a range of materials and contexts

Practically combine groups of objects (2s, 5s and 10s) and verbalise (then record) what has been found out: There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there? 2 add 2 add 2 equals 6

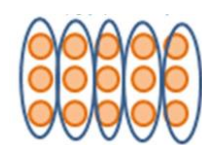


Mum washed 5 pairs of socks, how many socks did she get out of the washing machine? 2 + 2 + 2 + 2 = 10



relate division to grouping and sharing discrete and continuous quantities, to arrays and to repeated subtraction using a range of materials and contexts

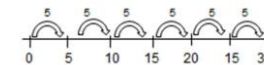
Initially, pupils to practically 'share' and 'group' using practical equipment and pictorial representation. Move on to using arrays to identify groups, use physical counters before pictorial representations:



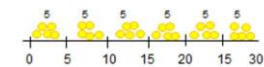
How many groups of 3 are in 15?

Grouping using a number line:

There are 30 children in the class, how many groups of 5 can we get into?



Use counters to support pupils understanding:

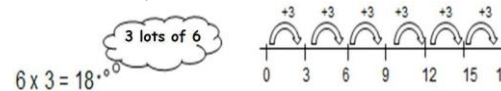


Use arrays for repeated addition and relate this to the x calculation: (Use counters or objects as well as visual representations to support understanding)

5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15

5 x 3 = 15 3 x 5 = 15

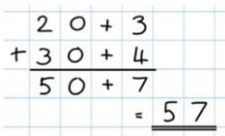
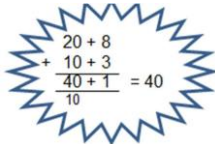
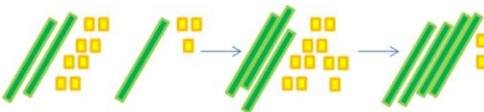
Use a number line for repeated addition:



record addition and subtraction in columns

Use partitioned column method.

Solve calculations that do not cross the tens boundary, until they are secure with the method. Then solve calculations that do cross the tens boundary. Use base 10 (diennes) to support the understanding of 'carrying' and the value of 'digits'.

$28 + 13$


record subtraction in columns

Introduce partitioned column method where no exchanging is required:

$$46 - 22 = 24$$

$$\begin{array}{r} 40 + 6 \\ - 20 + 2 \\ \hline 20 + 4 \end{array}$$

use base 10 (diennes) to support understanding



calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (x) and equals (=) signs

$$3 \times 4 = 12$$

Repetition of sentence with different vocabulary:

"3 times 4 equals 12"

"3 lots of 4 are 12"

"3 multiplied by 4 equals 12"

"The product of 3 and 4 is 12"

calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs

$$12 \div 4 = 3$$

Repetition of sentence with different vocabulary:

"12 divided by 4 equals 3"

"12 shared by 4 is 3"

"12 grouped into 4s is 3"

Year 2

Number – addition and subtraction

solve problems with addition:

- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying increasing knowledge of mental and written methods

Use all the models and images mentioned above. Discuss which is most effective and why.

Singapore Bar Method

solve problems with subtraction:

- using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying increasing knowledge of mental and written methods

Use all the models and images mentioned above. Discuss which is most effective and why.

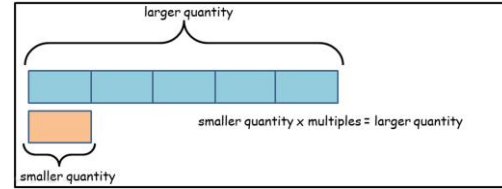
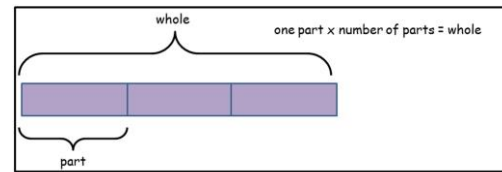
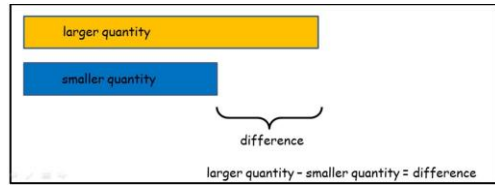
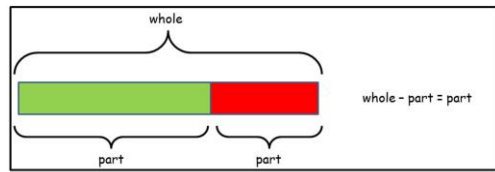
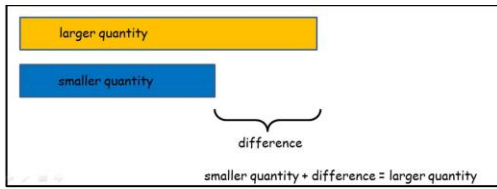
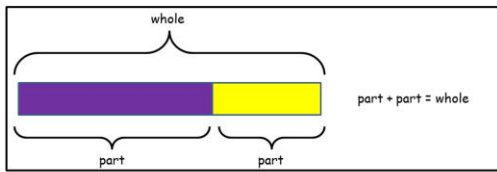
Singapore Bar Method

Number – multiplication and division

solve problems involving multiplication, using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in context

Use all the models and images mentioned above. Discuss which is most effective and why.

Singapore Bar Method



recognise and use the inverse relationship between addition and subtraction and use this to solve missing number problems

Missing numbers placed in all possible places.

$$\begin{aligned} 7 - 3 &= \square & \square &= 4 + 3 \\ 7 - \square &= 4 & 7 &= \square + 3 \\ \square - 3 &= 4 & 7 &= 4 + \square \\ \square - \nabla &= 4 & 7 &= \square + \nabla \end{aligned}$$

Number lines

$$7 + 4 = 11 \quad 11 - 4 = 7$$



As Year 1 and extend to

$$\begin{aligned} 14 + 5 &= 10 + \square \\ 17 - 5 &= 14 - \square \end{aligned}$$

and three numbers

$$\begin{aligned} 32 + \square + \square &= 100 \\ 35 &= 46 - \square - 7 \end{aligned}$$

recognise and use the inverse relationship between multiplication and division

$$3 \times 5 = 15$$

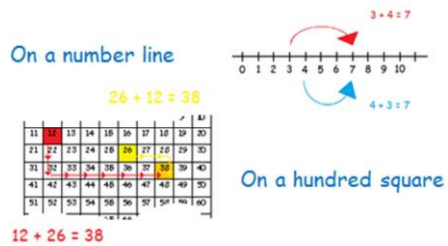


$$15 \div 3 = 5$$

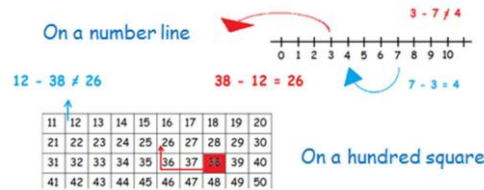
$$5 \times 3 = 15$$

$$15 \div 5 = 3$$

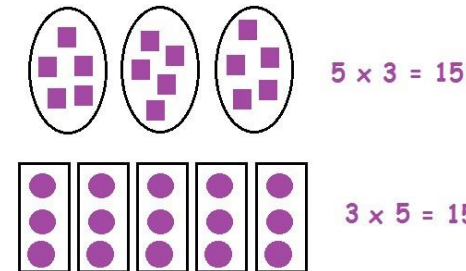
show that addition of two numbers can be done in any order (commutative)



show that subtraction of two numbers cannot be done in any order



show that multiplication of two numbers can be done in any order (commutative)



check their calculations, including adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$) - establishing commutativity and associativity of addition

See models and images above.

check their calculations, including by adding to check subtraction

See models and images above.

recognise and use the inverse relationship between addition and subtraction and use this to check calculations

See models and images above.

recognise and use the inverse relationship between addition and subtraction and use this to check calculations

See models and images above.

use commutativity and inverse relations to develop multiplicative reasoning

Arrays - related facts

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



$$\begin{aligned} 15 \div 3 &= 5 \\ 15 \div 5 &= 3 \end{aligned}$$

extend their understanding of the language of addition to include sum

+, add, more, plus, make, sum, total, altogether, score, double, near double, one more, two more... ten more, How many more to make...? How many more is... than...? How much more is...? Repetition of facts with different vocabulary:
"What is 2 add 5?" "What is 2 more than 5?"
"What is 2 plus 5?" "What is the total of 2 and 5?" etc

= equals, sign, is the same as

extend their understanding of the language of subtraction to include difference

- subtract, subtraction, take (away), minus, leave, how many are left/left over? one less, two less... ten less... one hundred less, how many fewer is... than...? how much less is...? difference between, half, halve, tens boundary $13 + 5 = 8$ Repetition of sentence with different vocabulary:
"13 subtract 5 equals 8" "5 less than 13 is 8"
"13 take away 5 equals 8" "The difference between 13 and 5 is 8" etc

= equals, sign, is the same as

use a variety of language to describe multiplication

count on (from, to), count back (from, to), count in ones, twos, threes, fours, fives... count in tens, lots of, groups of, x, times, multiply, multiplied by, multiple of, once, twice, three times... ten times... times as (big, long, wide... and so on), repeated addition, array, row, column, double, halve

= equals, sign, is the same as