ADDITION

Counting All

Strategy Explained

3 + 2

When counting all, the child counts to find the quantity of the first number (one, two, three on one hand), counts to find the quantity of the second number (one, two on the other hand), and then counts both hands to find the total.

Counting On

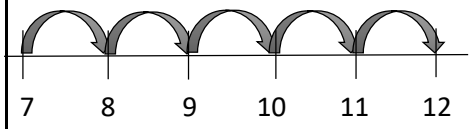
Strategy Explained

7 + 5

When counting on, the child starts with one of the numbers and counts on from this point. Children should be encouraged to count on from the larger number as they get more comfortable with this strategy.

Example:

"7 … 8, 9, 10, 11, 12"



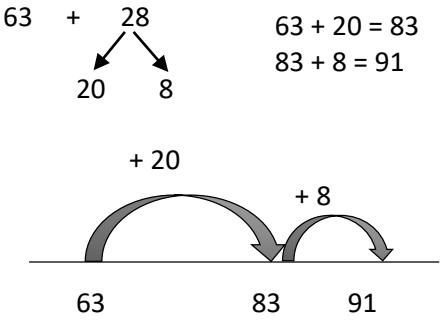
Adding Up in Chunks

Strategy Explained

63 + 28

When add up in chunks, a child will keep on addend whole and add the second number in easy-to-use chunks.

Example:



Doubles/Near Doubles

Strategy Explained

12 + 13

When using doubles or near doubles, the child uses the recall of their doubles facts to help them efficiently add.

Example:

"I know 12 plus 12 is 24, so 12 plus 13 is one more than that … 25"

Friendly Numbers/Round and Adjust

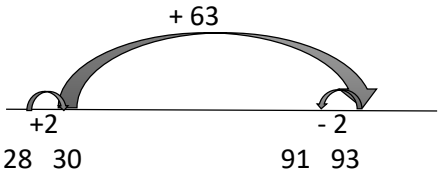
Strategy Explained

Students add to or subtract from one of the addends to make an easy number to add.

Example:

63 + 28

28 + 2 = 30 (round)
63 + 30 = 93
93 – 2 = 91 (adjust)

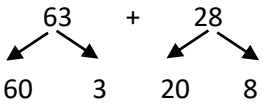


Place Value/Partial Sums

Strategy Explained

When using place value, the child breaks each number (decomposes) into multiple numbers based on their place value, and then like values are combined.

Example



60 + 20 = 80
3 + 8 = 11
80 + 11 = 91

SUBTRACTION

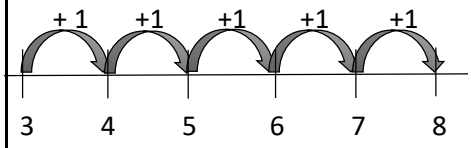
Adding Up/Counting Back or Removal

Adding Up Strategy Explained

8 – 3

Students start at 3 and add up until they arrive at 8.

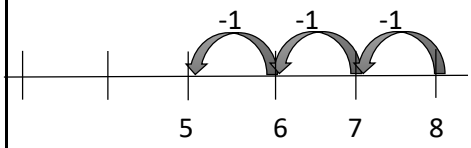
"3 … 4, 5, 6, 7, 8"



Counting Back Strategy Explained

8 – 3

Students start at 8 and count backwards 3



Removal in Chunks/Adding Up in Chunks

Removal in Chunks Strategy Explained

This strategy is essentially 'take-away' but using more efficient counting strategies to do so.

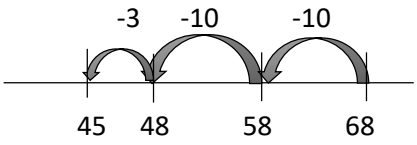
Example:

68 – 23

68 – (10 + 10+ 3) = 45

OR

68 – 23
68 – 20 = 48
48 = 3 = 45



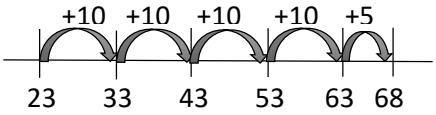
Adding Up in Chunks Strategy Explained

This strategy is based on students understanding that subtraction can be the difference or space between two numbers.

Example

68 - 23

23 + 10 = 33
33 + 10 = 43
43 + 10 = 53
53 + 10 = 63
63 + 5 = 68
10 + 10 + 10 + 10 + 5 = 45



Friendly Numbers/Round and Adjust

Strategy Explained

Students add to or subtract from the subtrahend to make an easier number to subtract.

Example:

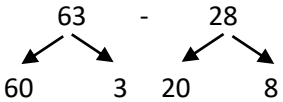
68 – 23
23 – 3 = 20 (round)
68 – 20 = 48
48 – 3 = 45 (adjust)

Place Value and Negative Numbers

Strategy Explained

Each number is broken apart into its respective place value then subtracted based on place value.

Example:



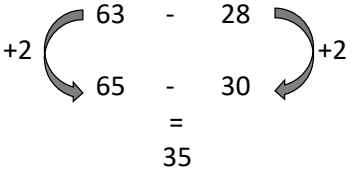
60 – 20 = 40
3 – 8 = -5
40 – 5 = 35

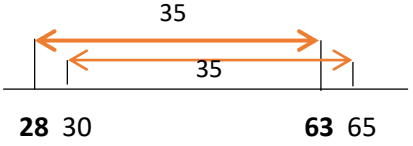
Keeping a Constant Difference

Strategy Explained

Adding or subtracting the same quantity from both the subtrahend and the minuend maintains the difference between the numbers.

Example





MULTIPLICATION

Skip Counting/Repeated Addition

Strategy Explained

Students count (or add up) by a number to find the product.

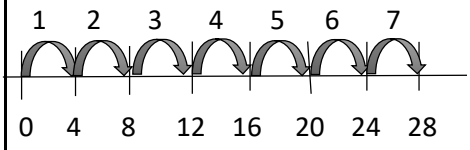
Example:

4 x 7 as 4 groups of 7

4, 8, 12, 16, 20, 24, 28
7, 14, 21, 28

4 + 4 + 4 + 4 + 4 + 4 + 4 = 28
7 + 7 + 7 + 7 = 28

4 x 7



Doubling

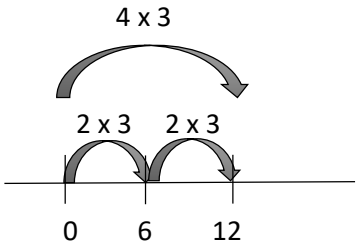
Strategy Explained

Students use their knowledge of skip counting and doubles or "times 2" facts to determine the product in more sophisticated situations.

Example:

4 x 3

2 x 3 = 6
2 x 3 = 6



Friendly Numbers

Strategy Explained

Students use facts they know to help them solve facts they do not know.

Example:

9 x 8

10 x 8 = 80 *we added one more group of 8
80 – 8 = 72 *we took that extra group of 8 away
9 x 8 = 72

7 x 6

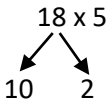
7 x 5 = 35 *start with a related known fact
35 + 7 = 42 *adding one more group of 7
7 x 6 = 42

Partial Products

Strategy Explained

Students look at the numbers being multiplied and split one (or both) numbers into numbers they are comfortable with using.

Example:



10 x 5 = 50
8 x 5 = 40
50 + 40 = 90

Doubling and Halving

Strategy Explained

Students understand that if they double one number and halve the other number they will have an equivalent expression.

Example:

16 x 8
16 x 8 = 32 x 8
32 x 8 = 64 x 4
64 x 4 = 128 x 2
128 x 2 = 256 x 1

Breaking Factors into Smaller Factors

Strategy Explained

Students understand that they can divide a number into its factors if this makes the problem easier for them to solve.

Example

12 x 6
12 x 6 = 2 x 6 x 6
12 x 6 = 2 x 36
12 x 6 = 72

12 x 13
12 x 13 = 3 x 4 x 13
12 x 13 = 3 x 52
12 x 13 = 156

DIVISION

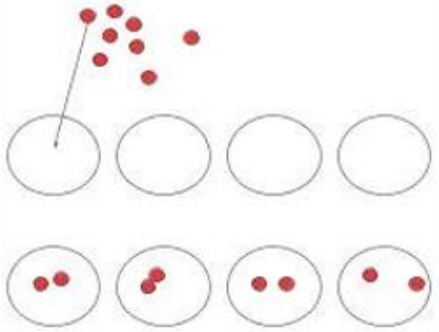
Fair Sharing/Sharing Out

Strategy Explained

Students share out into the corresponding number of groups until there are no more to share.

Example:

8 ÷ 4



Repeated Subtraction

Strategy Explained

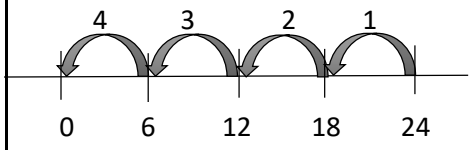
Students count backwards or repeatedly subtract to find the answer.

Example:

12 ÷ 4

12 – 4 = 8
8 – 4 = 4
4 – 4 = 0
12 ÷ 4 = 3

24 ÷ 6



Partial Quotients

Strategy Explained

Students use facts they know to take chunks away until they arrive at the answer.

Example:

42 ÷ 3

30 ÷ 3 = 10 *3 will fit into 42 at least 10 times, but still 12 left
12 ÷ 3 = 4 *3 fits into the remaining 12, 4 times
42 ÷ 3 = 14

Multiplying Instead

Strategy Explained

Students use their understanding of multiplication to help them solve division questions. This works because multiplication and division are inverse operations.

56 ÷ 8

8 x ? = 56
8 x 7 = 56
64 ÷ 8 = 7

Halving and Halving

Strategy Explained

Students understand that if they divide each number in a division question by the same number, it will create an equivalent question. They can use this understanding to make the question easier for them to solve.

96 ÷ 8

96 ÷ 8 = 48 ÷ 4 *dividing each number by 2
48 ÷ 4 = 24 ÷ 2 *dividing each number by 2 again
24 ÷ 2 = 12 ÷1 * dividing each number by 2 again
96 ÷ 8 = 12

Students do not have to divide each number by 2. If they can see that a bigger number is a factor of both numbers, they can divide with that number. In the above example, the student could have started to divide both number by 4.