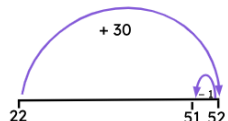


Partitioning

Unitising

Redistribution (move

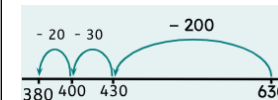
$$\begin{array}{r} 999 + 945 = \\ +1 \downarrow \quad \downarrow -1 \\ 1,000 + 944 = 1,944 \end{array} \qquad \begin{array}{r} 99,999 + 99,945 = \\ +1 \downarrow \quad \downarrow -1 \\ 100,000 + 99,944 = 199,944 \end{array}$$
$$\begin{array}{r} 22 + 29 = 51 \\ +1 \quad \downarrow \quad \uparrow -1 \\ 22 + 30 = 52 \end{array}$$

$$\begin{array}{r} \pounds 30 + \pounds 26 = \pounds 56 \\ + \pounds 0.76 \quad \downarrow \quad \quad \quad \downarrow \quad + \pounds 0.76 \\ \pounds 30.76 + \pounds 26 = \pounds 56.76 \end{array}$$

		4	5.2	
		3	3.4	7
	+		3.5	
		8	2.1	7
		1	1	

Partitioning

Unitising

Bridging

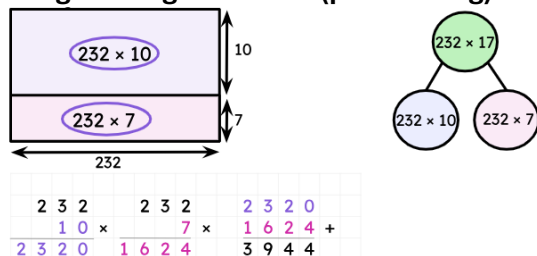

$$430 - 290 = 140$$


$$510 - 380 = 130$$

$$\begin{array}{r} 23.17 \text{ km} \\ - 2.9 \text{ km} \\ \hline 20.27 \text{ km} \end{array}$$
$$\begin{array}{r} 183 - 47 = 136 \\ +4 \quad \downarrow \qquad \qquad \uparrow -4 \\ 187 - 47 = 140 \end{array}$$
$$\begin{array}{r} 19.67 - 3.95 = 15.72 \\ +0.05 \quad \downarrow \quad \downarrow \quad +0.05 \\ 19.72 - 4.00 = 15.72 \end{array}$$

Multiplication

3-digit x 2 digit informal (partitioning)



Long multiplication

No regrouping

Long multiplication

$$\begin{array}{r} 33 \\ 21 \times \\ \hline 66 \\ 660 + \\ \hline 693 \end{array}$$

Regrouping

$$\begin{array}{r} 11 \\ 153 \\ 22 \times \\ \hline 306 \\ 3060 + \\ \hline 3366 \end{array}$$

$$\begin{array}{r} 121 \\ 1346 \\ 25 \times \\ \hline 6730 \\ 26920 + \\ \hline 33650 \\ 11 \end{array}$$

Associative law - The associative law states that it doesn't matter how you group or pair values (i.e. which we calculate first), the result is still the same. It applies for addition and multiplication.

$$\begin{aligned} 41 \times 15 &= 41 \times 5 \times 3 \\ &= 205 \times 3 \\ &= 615 \end{aligned}$$

$$\begin{aligned} 41 \times 15 &= 41 \times 3 \times 5 \\ &= 123 \times 5 \\ &= 615 \end{aligned}$$

Short multiplication and combining **partial products**.

$$\begin{array}{r} 33 \\ 20 \times \\ \hline 660 \end{array} \quad \begin{array}{r} 33 \\ 1 \times \\ \hline 33 \end{array} \quad \begin{array}{r} 660 \\ 33 + \\ \hline 693 \end{array}$$

Long multiplication

$$\begin{array}{r} 33 \\ 21 \times \\ \hline 66 \\ 660 + \\ \hline 693 \end{array}$$

Division

Short division

$$528 \div 12 = 44$$

$$\begin{array}{r} 044 \\ 12 \overline{) 528} \\ \underline{52} \\ 8 \end{array}$$

Long division known facts

$$792 \div 12 = 66$$

$$\begin{array}{r} 066 \\ 12 \overline{) 792} \\ \underline{72} \\ 72 \\ \underline{72} \\ 0 \end{array}$$

(6 tens x 12 = 72 tens)

(6 ones x 12 = 72 ones)

Outside known multiplication facts

$$578 \div 17 = 34$$

$$\begin{array}{r} 034 \\ 17 \overline{) 578} \\ \underline{51} \\ 68 \\ \underline{68} \\ 0 \end{array}$$

(3 tens x 17 = 51 tens)

(4 ones x 17 = 68 ones)

	x 17
1	17
2	34
3	51
4	68
5	85
6	102
7	119
8	136
9	153
10	170

2-digit divisor with remainders

$$5,400 \div 35 = 154 \text{ r } 10$$

$$\begin{array}{r} 0154 \\ 35 \overline{) 5400} \\ \underline{35} \\ 1900 \\ \underline{175} \\ 150 \\ \underline{140} \\ 10 \end{array}$$

(1 hundred x 35 = 35 hundreds)

(5 tens x 35 = 175 tens)

(4 ones x 35 = 140 ones)

	x 35
1	35
2	70
3	105
4	140
5	175
6	210
7	245
8	280
9	315
10	350

2-digit divisor with fraction remainders

$3,600 \div 28 = 128 \text{ r } 16$

		0	1	2	8	
2	8	3	6	0	0	
		2	8			
		8	0	0		
		5	6			
		2	4	0		
		2	2	4		
			1	6		

(1 hundred $\times 28 =$ 28 hundreds)
(2 tens $\times 28 =$ 56 tens)
(8 ones $\times 28 =$ 224 ones)

The **remainder** can be represented in a different way.

16 apples could partly fill a bag.

The whole bag is 28 and my **remainder** is 16

I could say that this is $\frac{16}{28}$ of a bag.

So 128 full bags and $\frac{16}{28}$ of a bag.

$3,600 \div 28 = 128 \frac{16}{28}$

2-digit divisor with remainders as decimals

28 is 28 ones which can be regrouped as 280 tenths.

I can make 8 groups of 35 tenths with 280 tenths.

$5,418 \div 35 = 154.8$

		0	1	5	4	.
3	5	5	4	1	8	.0
		3	5			
		1	9	1	8	
		1	7	5		
			1	6	8	
			1	4	0	
				2	8	.0
				2	8	.0

(8 tenths $\times 35 =$ 280 tenths)