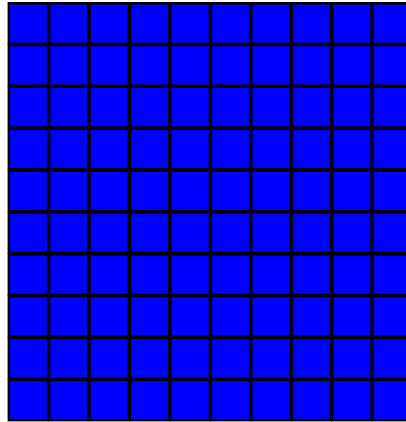


Large Cube



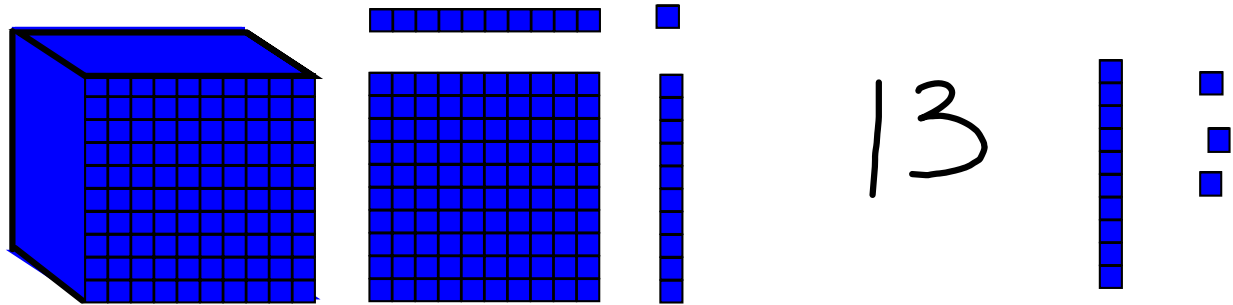
Flat



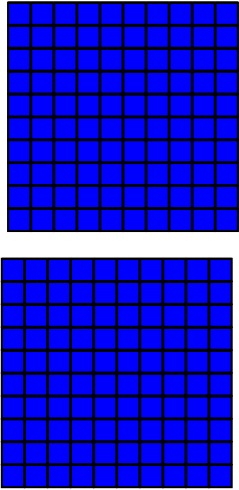
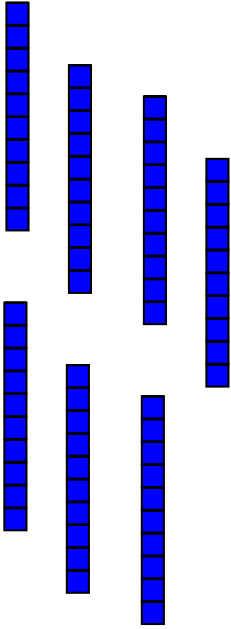
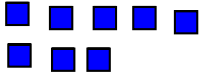
Rod

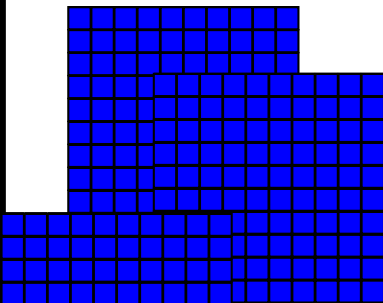
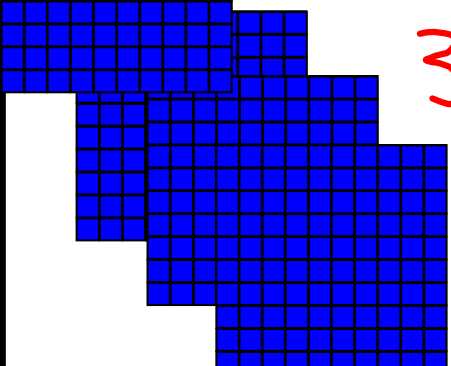


Little Cube



13

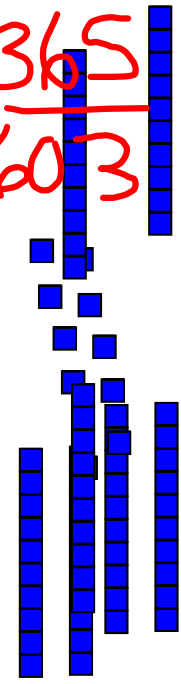
<p>Hundreds 100</p>	<p>Tens 10</p>	<p>Ones 1</p>
		

Hundreds 100	Tens 10	Ones 1
 238	30	8
 300	60	5

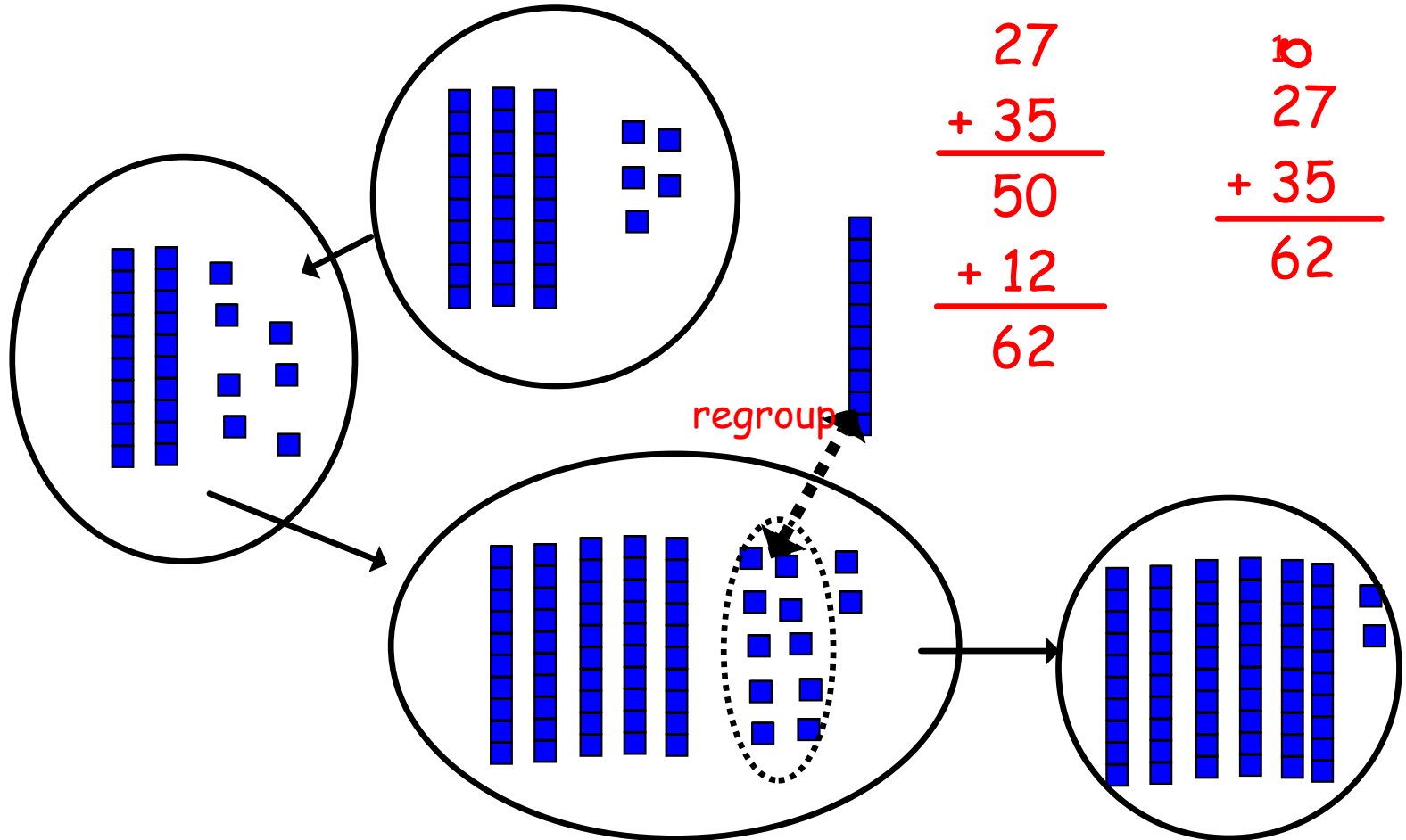
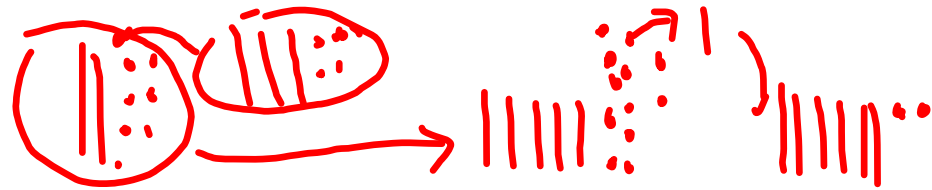
238

365

603



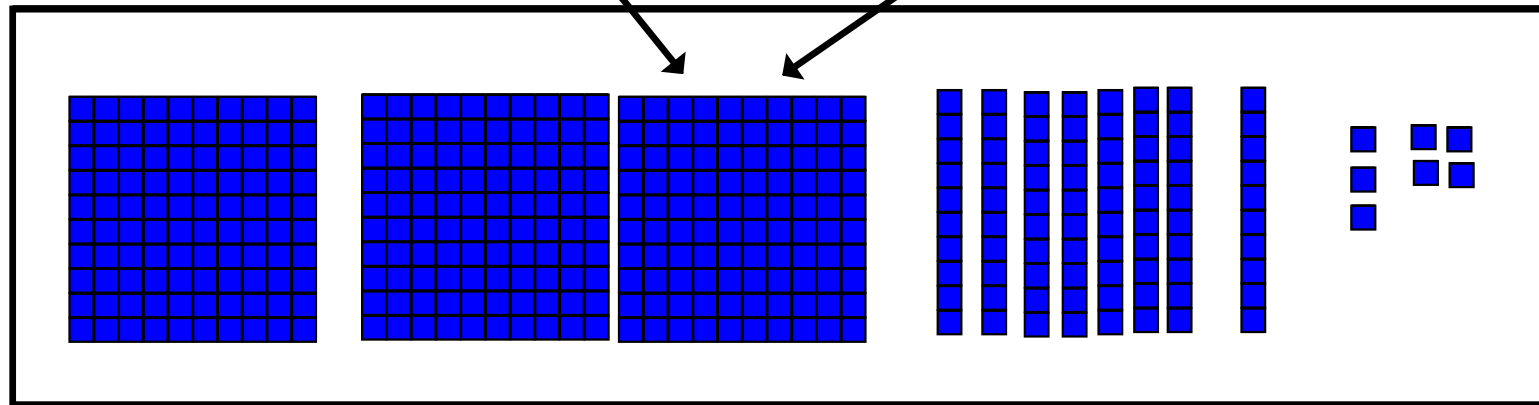
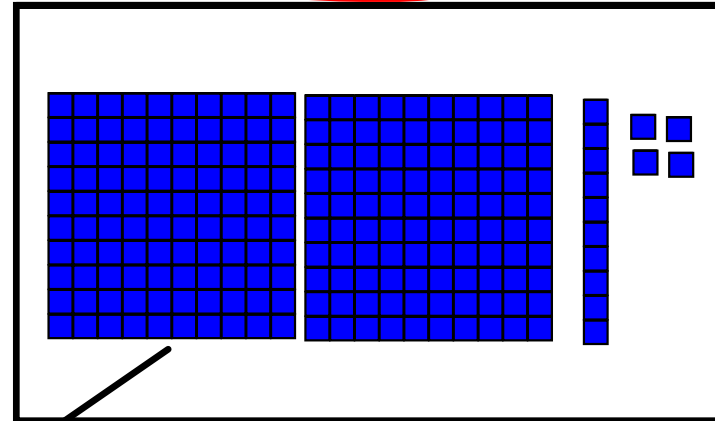
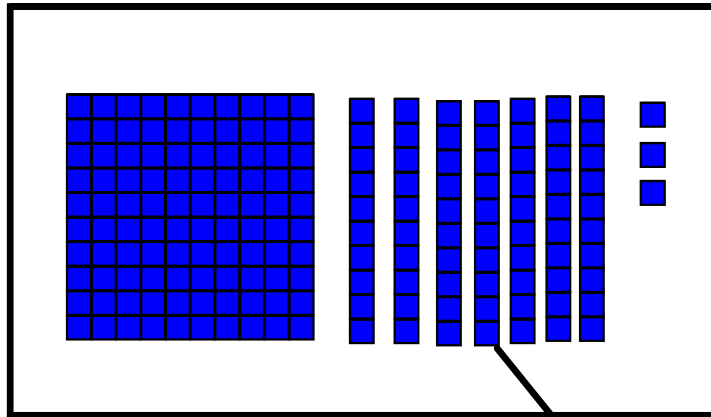
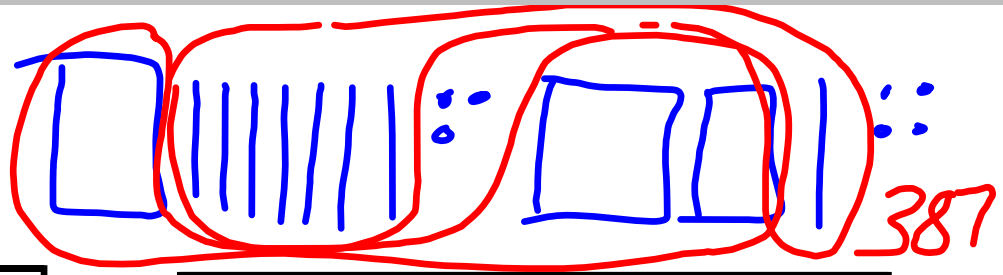
Show $27 + 35$.



$$\begin{array}{r}
 27 \\
 + 35 \\
 \hline
 50 \\
 + 12 \\
 \hline
 62
 \end{array}$$

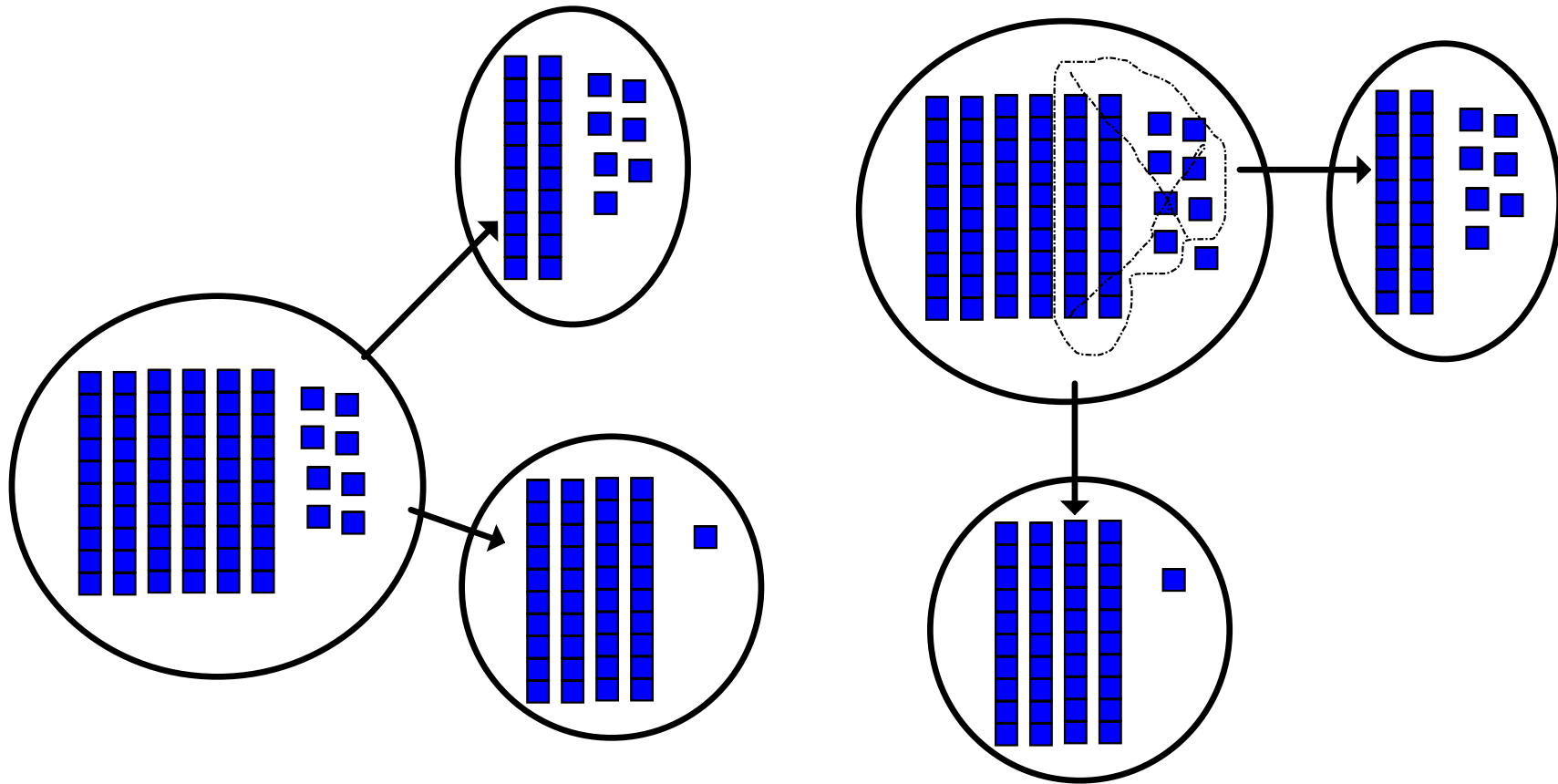
$$\begin{array}{r}
 10 \\
 27 \\
 + 35 \\
 \hline
 62
 \end{array}$$

Show $173 + 214$.

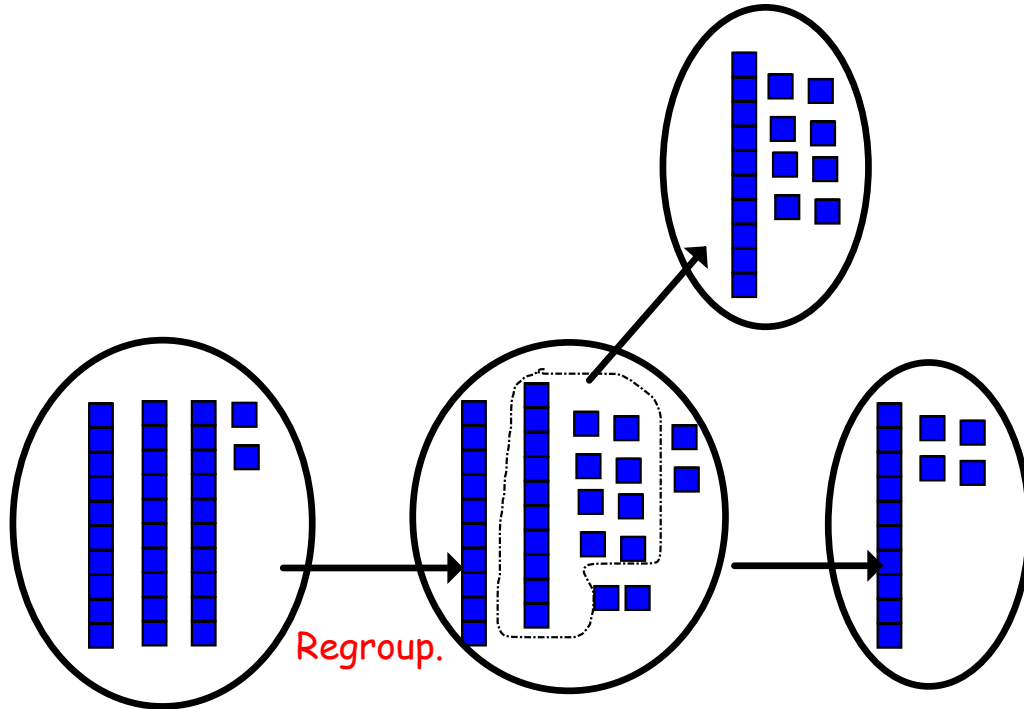
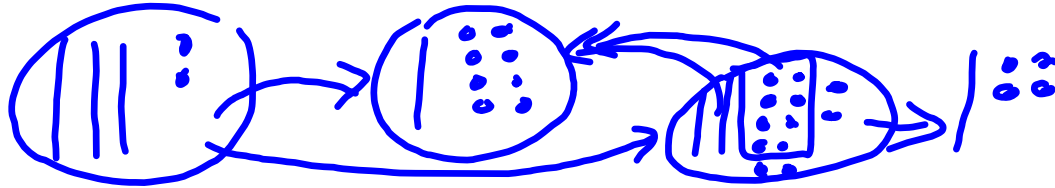


$$100 + 200 + 70 + 10 + 3 + 4 = 300 + 80 + 7 = 387$$

Show 68 - 27.



Show 32 - 18.



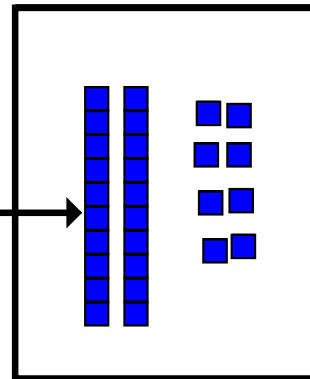
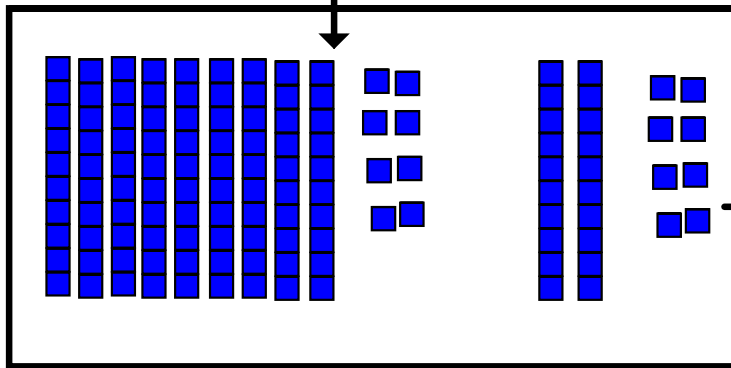
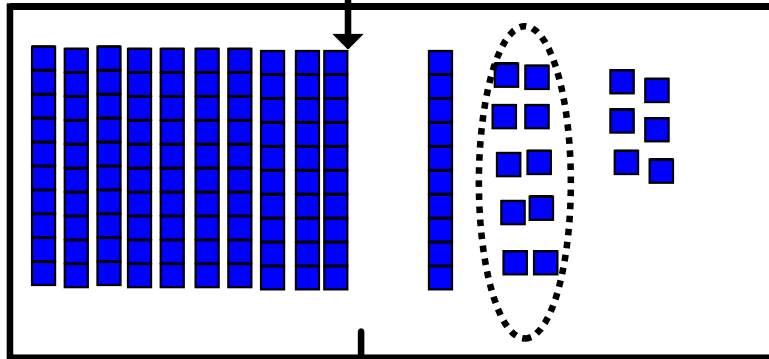
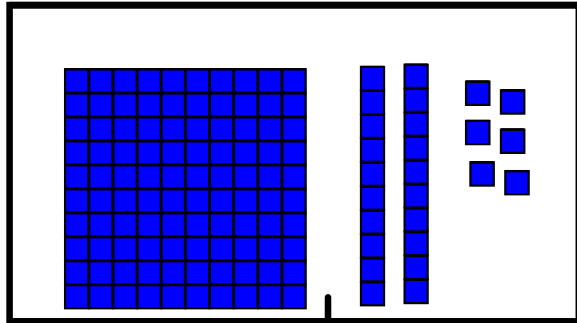
$$\begin{array}{r}
 \overset{2}{\cancel{3}}\overset{1}{2} \\
 -18 \\
 \hline
 14
 \end{array}$$

$$\begin{array}{l}
 32 - 18 \\
 20 - 10 = 10 \\
 12 - 8 = 4 \\
 10 + 4 = 14
 \end{array}$$

$$\begin{array}{l}
 32 - 18 \\
 32 = 20 + 12 \\
 20 - 18 = 2 \\
 12 + 2 = 14
 \end{array}$$

$$\begin{array}{l}
 32 - 18 \\
 32 - 10 = 22 \\
 22 - 8 \\
 22 - 10 = 12 \\
 12 + 2 = 14
 \end{array}$$

Show 126 - 98.



$$126 - 98$$

$$110 - 90 = 20$$

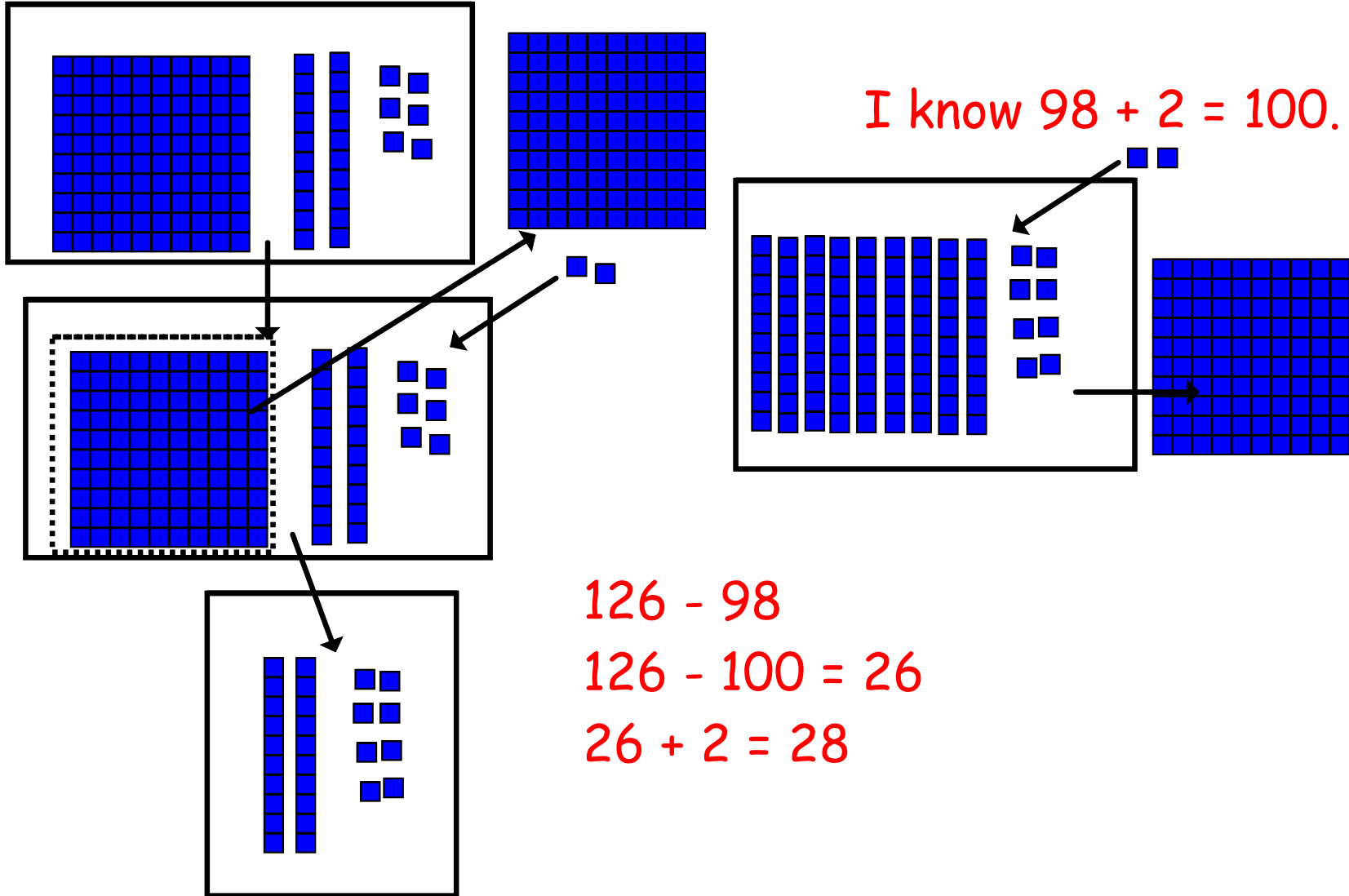
$$16 - 8 = 8$$

$$20 + 8 = 28$$

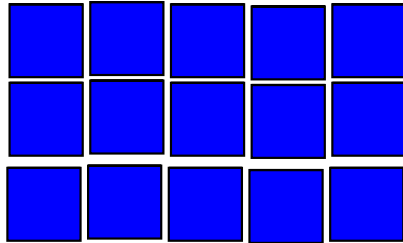
$$\begin{array}{r} 126 \rightarrow 128 \\ - 98 - 10 \\ \hline 28 \end{array}$$

$$\begin{array}{r} 126 \\ - 98 \\ \hline 28 \end{array}$$

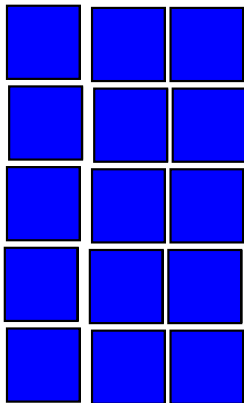
Show $126 - 98$.



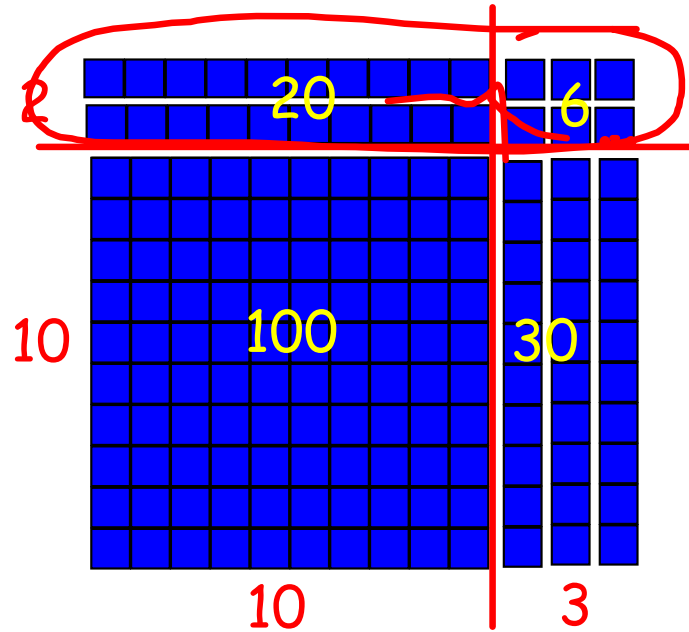
3×5



5×3



12×13



$$\begin{array}{r} 13 \\ \times 12 \\ \hline 26 \\ 130 \\ \hline 156 \end{array}$$

Partial Products

$10 \times 10 = 100$

$10 \times 3 = 30$

$2 \times 10 = 20$

$2 \times 3 = 6$

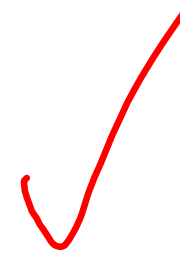
100

30

20

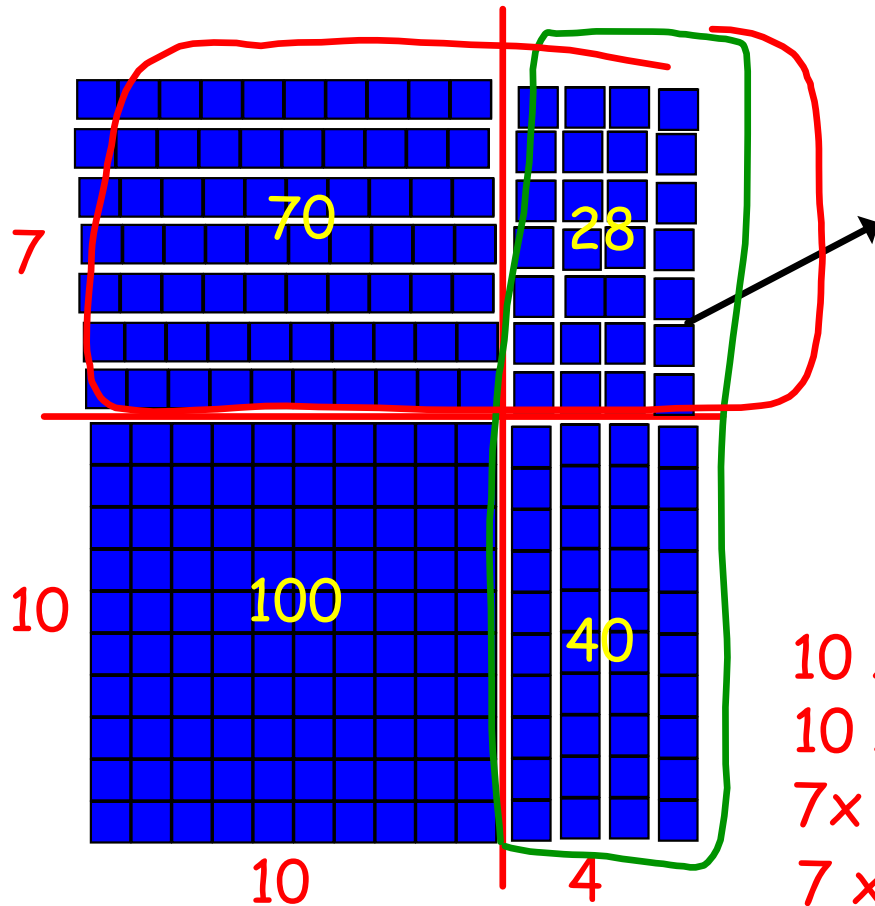
+6

 156



$$17 \times 14 = 98 + 140$$

$$100 + 38 = 238$$

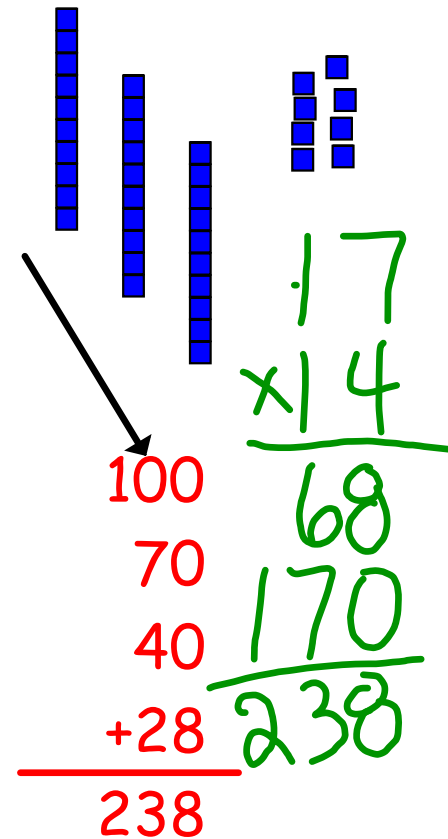
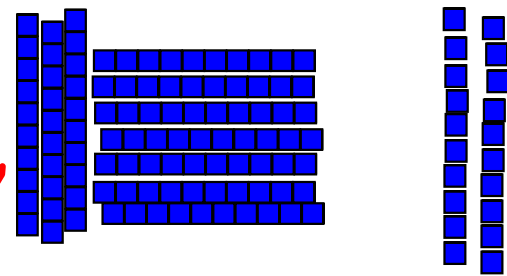


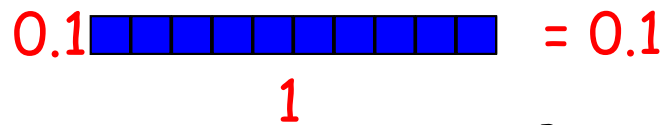
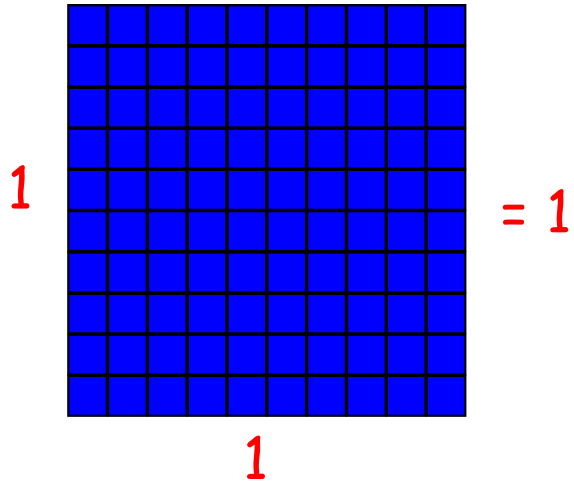
$$10 \times 10 = 100$$

$$10 \times 4 = 40$$

$$7 \times 10 = 70$$

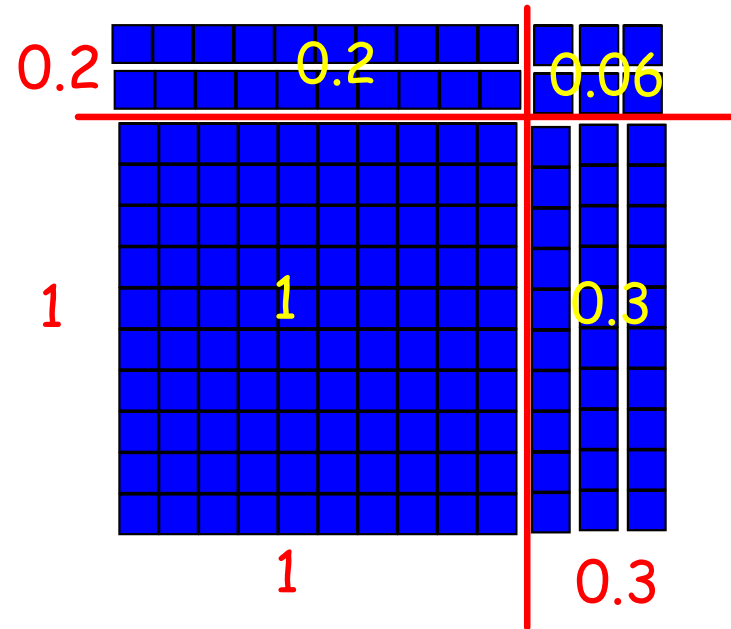
$$7 \times 4 = 28$$



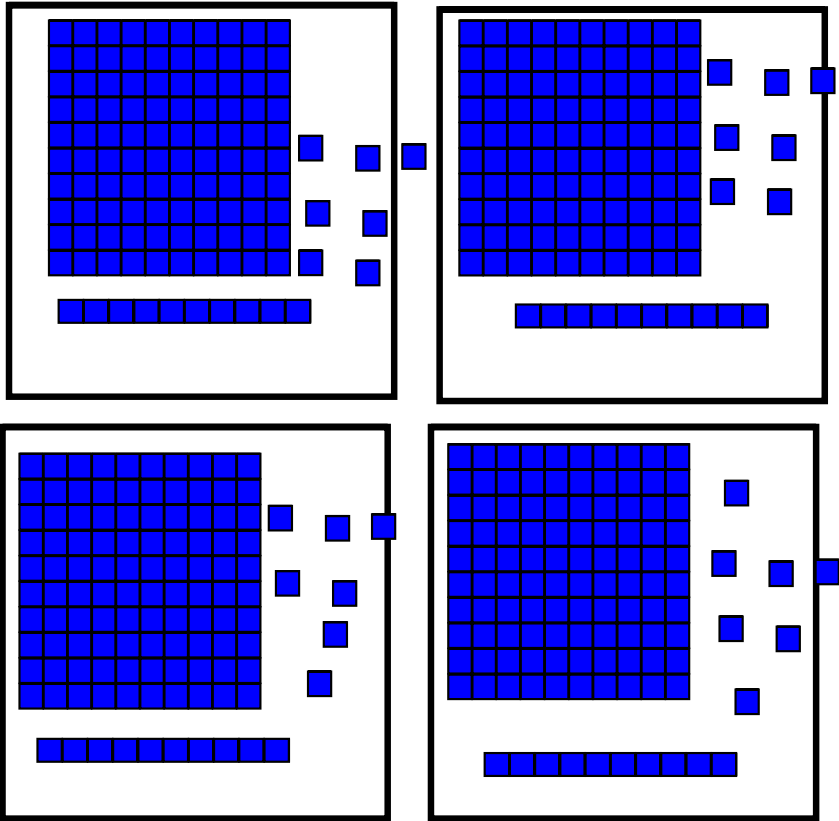


$0.1 \times 0.1 = 0.01$

1.2×1.3



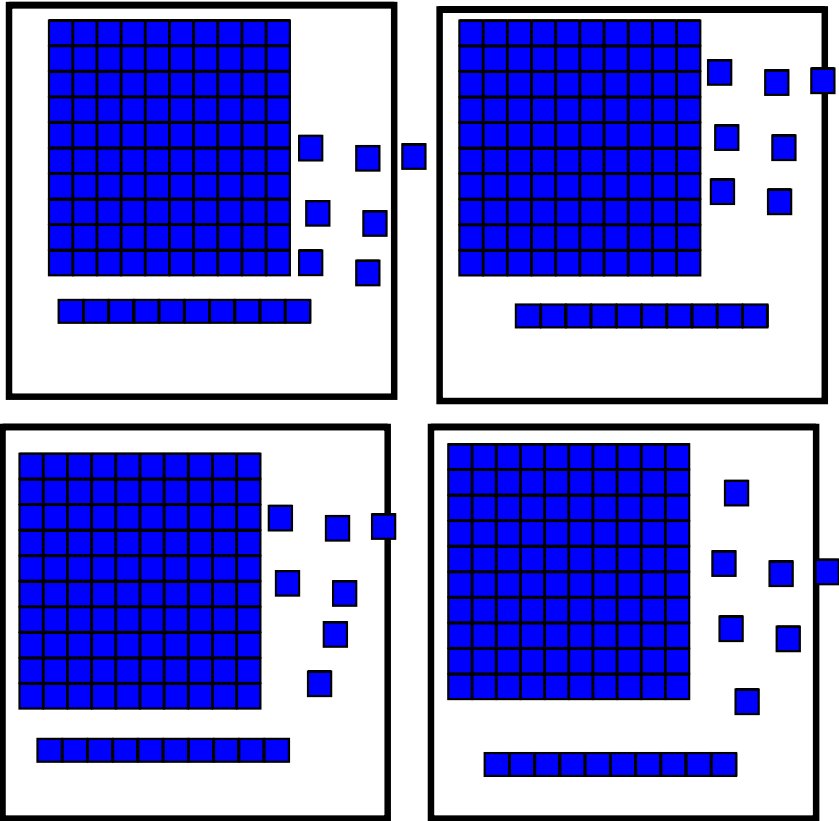
$1 \times 1 = 1$	1.00
$1 \times 0.3 = 0.3$	0.30
$0.2 \times 1 = 0.2$	0.20
$0.2 \times 0.3 = 0.06$	+0.06
	1.56



$$468 \div 4$$



$$\begin{array}{r}
 100 \} 117 \\
 100 \\
 \hline
 4 \overline{) 468} \\
 \underline{400} \\
 68 \\
 \underline{40} \\
 28 \\
 \underline{28} \\
 0
 \end{array}$$



$$468 \div 4$$



$$\begin{array}{r}
 100 \overline{) 468} \\
 \underline{400} \\
 68 \\
 \underline{40} \\
 28 \\
 \underline{28} \\
 0
 \end{array}$$

Teaching the Multiplication Facts

	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Free Facts:
1, 2, 5, 10

Almost Free Facts:
4 - double double
3 - double plus a set
9 - nifty nines

More Fun Facts:
Perfect Squares

09
18
27
36
45
54

63
72
81
90

Teaching the Multiplication Facts

	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Strategies for the harder Facts:

Perfect Squares and one aways

$$6 \times 8 = 48$$

$$7 \times 7 = 49$$

$$8 \times 6 = 48$$

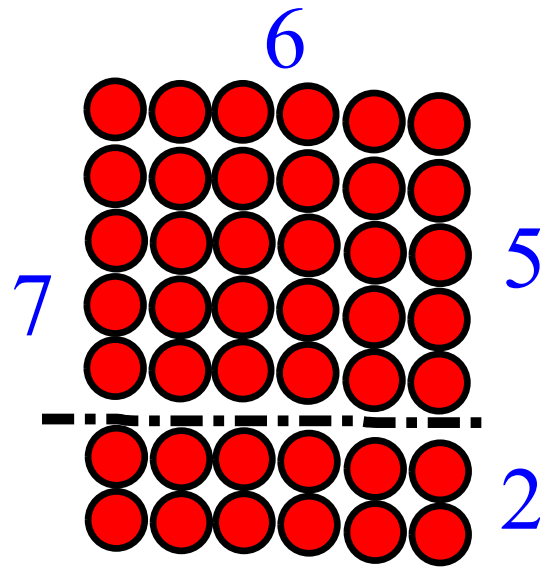
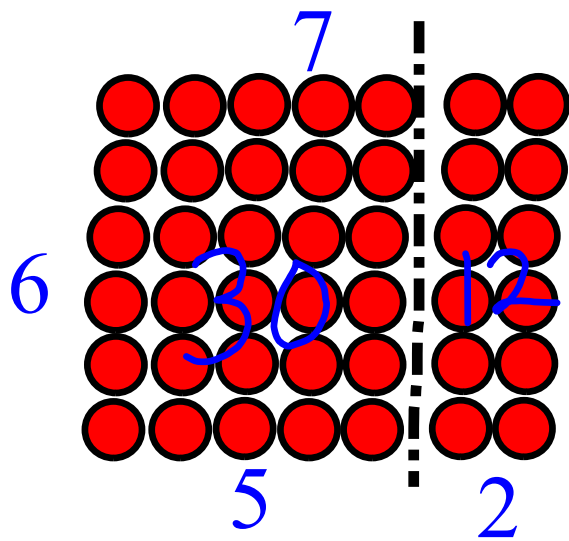
using the distributive property (build from 5 and 2 facts)

$$6 \times 7 = 6 \times 5 + 6 \times 2$$

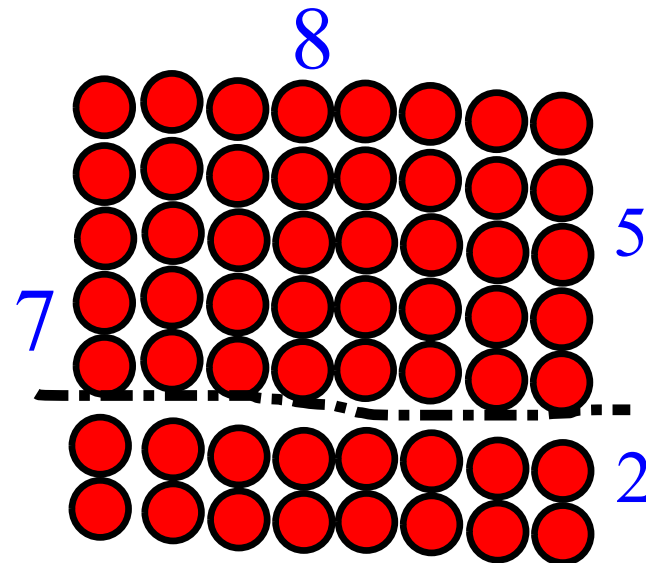
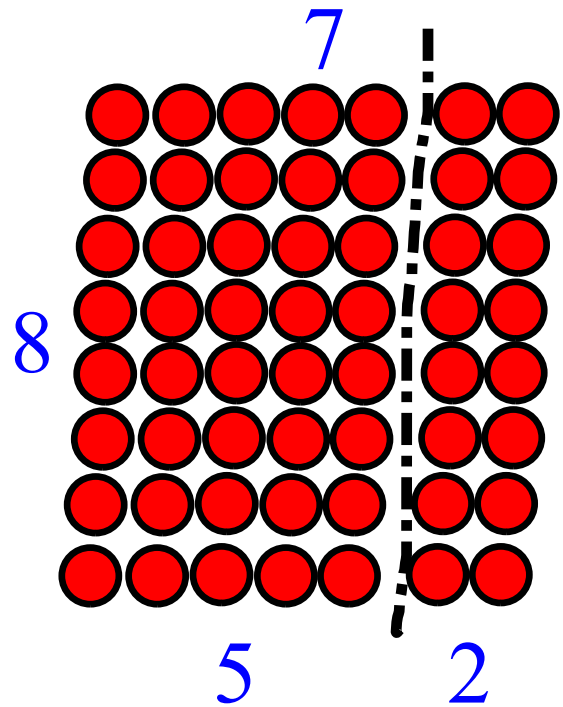
$$7 \times 6 = 5 \times 6 + 2 \times 6$$

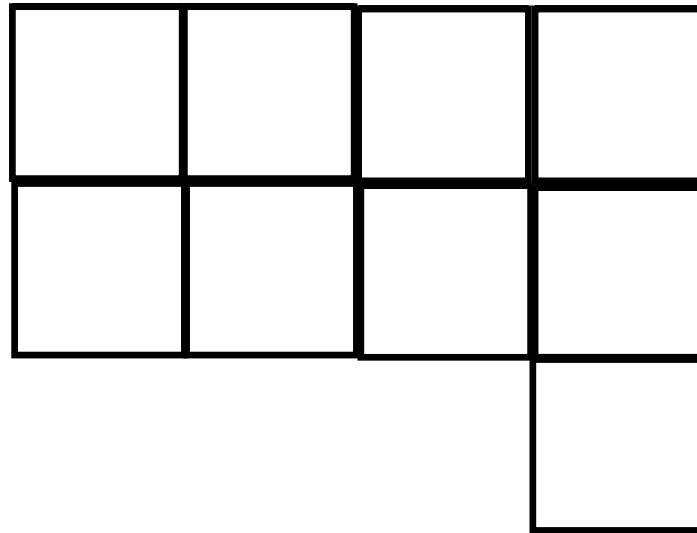
$$8 \times 7 = 8 \times 5 + 8 \times 2$$

$$7 \times 8 = 5 \times 8 + 2 \times 8$$



Visualizing The
Distributive
Property





$$1.2 \times \underline{1.9}$$

$$1.2 \times 2.0 = 2.4$$

$$\bullet 1 \times 1.2 = \textcircled{1.2} \quad 2.38$$

$$84 \times 25$$

Associative Law

$$21 \times 4 \times 25$$
$$\rightarrow 42 \times 50$$
$$21 \times 100$$