

**COMMUTATIVE LAW of MULTIPLICATION**

This means numbers can be multiplied in any order.

$3 \times 10 \times 5 = 3 \times 5 \times 10$

We can rearrange the order in which we multiply to make combinations that are easier to multiply.

Is it easier to solve  $3 \times 10 \times 6$  or is it easier to solve  $3 \times 6 \times 10$

X	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

$23 \times 8 =$   
 $(20+3) \times 8$   
 $(\quad \times \quad) + (\quad \times \quad)$   
 $\quad + \quad$   
 $14 \times 8 =$   
 $(10+4) \times 8$   
 $(\quad \times \quad) + (\quad \times \quad)$   
 $\quad + \quad$

$12 \times 8 =$   
 $(10+2) \times 8$   
 $(\quad \times \quad) + (\quad \times \quad)$   
 $\quad + \quad$   
 $12 \times 25 =$   
 $(10+2) \times 25$   
 $(\quad \times \quad) + (\quad \times \quad)$   
 $\quad + \quad$

$20 \times 9 =$   
 $2 \times 10$   
 $\quad \times \quad \times 9$   
 $\quad \times \quad \times 10$   
 $30 \times 8 =$   
 $3 \times 10$   
 $\quad \times \quad \times 8$   
 $\quad \times \quad \times 10$

$90 \times 6 =$   
 $40 \times 7 =$   
 $80 \times 8 =$   
 $20 \times 8 =$   
 $300 \times 7 =$   
 $200 \times 6 =$

**DISTRIBUTIVE LAW of MULTIPLICATION**

Groups of the same number can be split into parts.

XXXX XXXX XXXX XXXX XXXX XXXX

$3 \times 4 + 3 \times 4 = 6 \times 4$   
 $(3 \text{ groups of } 4) + (3 \text{ groups of } 4) = 6 \text{ groups of } 4$   
 $(6 \text{ groups of } 4) \text{ is the same as } (3 \text{ groups of } 4) + (3 \text{ groups of } 4)$   
 $3 \text{ groups of } 4 + 3 \text{ groups of } 4 = 6 \text{ groups of } 4$   
 so .....  $6 \times 4 = 3 \times 4 + 3 \times 4$   
 $12 \times 35$   
 $12 \text{ groups of } 35 = (10 \text{ groups of } 35) + (2 \text{ groups of } 35)$   
 $12 \times 35 =$   
 $(10 + 2) \times 35 = 10 \times 35 + 2 \times 35$   
 $= 350 + 70$   
 $= 420$

**Build Up Strategy**

If  $4 \times 5 = 20$   
 then  $5 \times 5 = 25$   
 and  $6 \times 5 = 30$

$\left. \begin{array}{l} +5 \\ +5 \end{array} \right\}$  We add 1 group of 5 as we build up.

**Try these:**

$5 \times 6 = 30$	$20 \times 6 = 120$	$10 \times 8 =$
$6 \times 6 =$	$21 \times 6 =$	$9 \times 8 =$
$7 \times 6 =$	$22 \times 6 =$	$8 \times 8 =$
$10 \times 7 = 70$	$20 \times 7 = 140$	$20 \times 7 = 140$
$11 \times 7 =$	$21 \times 7 =$	$19 \times 7 =$
$12 \times 7 =$	$22 \times 7 =$	$18 \times 7 =$

**Try Building Down**