

## 8: Calculations with Hundreds and Thousands

**Question:** What is the value of  $2000 \times 300$ ?

Misconception	Correct
There are several possible common incorrect answers including	As
60 000	$2 \times 3 = 6$
or	and
6 000 000	$1000 \times 100 = 100\,000$
	then
	$2000 \times 300 = 600\,000$

### Further Explanation

As before there is only one answer and it is completely logical! We will build on previous knowledge to get the answer; you know, for example, that

$$\begin{aligned} 10 \times 10 &= 100 \\ 10 \times 100 &= 1000 \\ 10 \times 1000 &= 10\,000 \\ 10 \times 10\,000 &= 100\,000 \end{aligned}$$

and so on. Hence it is easy to see that

$$100 \times 1000 = 10 \times \underline{10 \times 1000} = 10 \times \underline{10\,000} = 100\,000$$

and similarly

$$1000 \times 100 = 100\,000$$

We can use this result, but we first note that we can write 2000 and 300 as

$$2000 = 2 \times 1000 \quad \text{and} \quad 300 = 3 \times 100$$

This gives

$$\begin{aligned} 2000 \times 300 &= (2 \times 1000) \times (3 \times 100) \\ &= 2 \times 1000 \times 3 \times 100 \end{aligned}$$

and, as the order of multiplication does not matter, we can rewrite this as

$$\begin{aligned} 2000 \times 300 &= 2 \times 3 \times 1000 \times 100 \\ &= (2 \times 3) \times (1000 \times 100) \\ &= 6 \times 100\,000 \\ &= 600\,000 \end{aligned}$$

**Follow-up Exercises**

1. Calculate:

- (a)  $100 \times 10$       (b)  $100 \times 100$       (c)  $1000 \times 10$   
(d)  $1000 \times 100$       (e)  $1000 \times 1000$       (f)  $100 \times 10000$

2. Calculate:

- (a)  $20 \times 20$       (b)  $20 \times 40$       (c)  $30 \times 40$   
(d)  $50 \times 20$       (e)  $60 \times 60$       (f)  $100 \times 30$

3. Calculate:

- (a)  $200 \times 30$       (b)  $500 \times 20$       (c)  $200 \times 300$   
(d)  $400 \times 300$       (e)  $500 \times 500$       (f)  $1000 \times 40$   
(g)  $2000 \times 30$       (h)  $200 \times 4000$       (i)  $300 \times 4000$   
(j)  $2000 \times 4000$       (k)  $50 \times 40000$       (l)  $3000 \times 7000$

**Answers**

1. (a) 1000      (b) 10000      (c) 10000  
(d) 100000      (e) 1000000      (f) 1000000
2. (a) 400      (b) 800      (c) 1200  
(d) 1000      (e) 3600      (f) 3000
3. (a) 6000      (b) 10000      (c) 60000  
(d) 120000      (e) 250000      (f) 40000  
(g) 60000      (h) 800000      (i) 1200000  
(j) 8000000      (k) 2000000      (l) 21000000