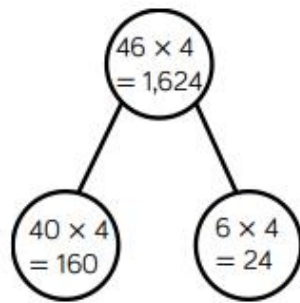


Ron is calculating 46 multiplied by 4 using the part-whole model.



Can you explain Ron's mistake?

Here are three incorrect multiplications.

	T	O
	6	1
x		5
<hr/>		
	3	5

	T	O	
	7	4	
x		7	
<hr/>			
	4	9	8

	T	O	
	2	6	
x		4	
<hr/>			
	8	2	4

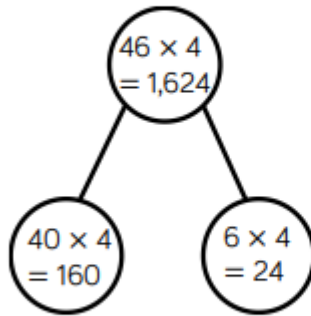
Correct the multiplications.

## Always, sometimes, never

- When multiplying a two-digit number by a one-digit number, the product has 3 digits.
- When multiplying a two-digit number by 8 the product is odd.
- When multiplying a two-digit number by 7 you need to exchange.

Prove it.

Ron is calculating 46 multiplied by 4 using the part-whole model.



Ron has multiplied the parts correctly, but added them up incorrectly.  
 $160 + 24 = 184$

Can you explain Ron's mistake?

Here are three incorrect multiplications.

	T	O
	6	1
x		5
<hr/>		
	3	5

	T	O	
	7	4	
x		7	
<hr/>			
	4	9	8

	T	O	
	2	6	
x		4	
<hr/>			
	8	2	4

	T	O	
	6	1	
x		5	
<hr/>			
	3	0	5
	3		

	T	O	
	7	4	
x		7	
<hr/>			
	5	1	8
	2		

	T	O	
	2	6	
x		4	
<hr/>			
	1	0	4
	2		

Correct the multiplications.

### Always, sometimes, never

- When multiplying a two-digit number by a one-digit number, the product has 3 digits.
- When multiplying a two-digit number by 8 the product is odd.
- When multiplying a two-digit number by 7 you need to exchange.

Prove it.

Sometimes:  $12 \times 2$  has only two-digits;  $23 \times 5$  has three digits.

Never: all multiples of 8 are even.

Sometimes: most two-digit numbers need exchanging, but not 10 or 11