Multiplying 4-digit numbers by a single digit

What is 1814 multiplied by 3? Remember to estimate: $2000 \times 3 = 6000$

Step 1

```
  1 8 1 4
×       3
        2
      1
```

Step 2

```
  1 8 1 4
×       3
      4 2
      1
```

Step 3

```
  1 8 1 4
×       3
    4 4 2
    2   1
```

Step 4

```
  1 8 1 4
×       3
  5 4 4 2
  2   1
```

Check the answer is close to the estimate:
$1814 \times 3 = 5442$

1 Complete these multiplications. Estimate the answer first.

a)
```
  2 4 1 8
×       4
```

b)
```
  3 2 7 3
×       3
```

c)
```
  1 4 9 1
×       6
```

d)
```
  1 1 2 4
×       8
```

e)
```
  3 7 6 9
×       2
```

f)
```
  3 0 8 8
×       3
```

2 Answer these.

a) What is three thousand eight hundred and eighty-six multiplied by four?

b) Calculate 3939×3.

c) A shop has 1386 pairs of shoes. How many shoes are there altogether?

d) Golf balls are sold in packs of five. How many balls will there be in 4855 packs?

e) Each week a factory produces 5648 steel rods. How many rods are produced in total in a month?
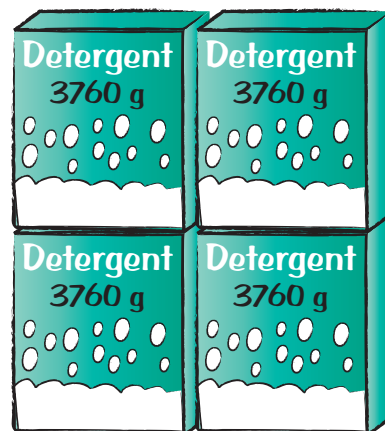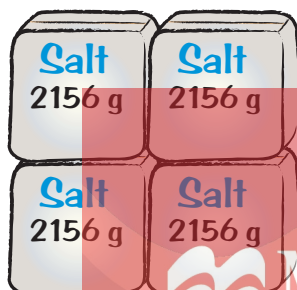
3 Write the total weight on each shelf.

a)
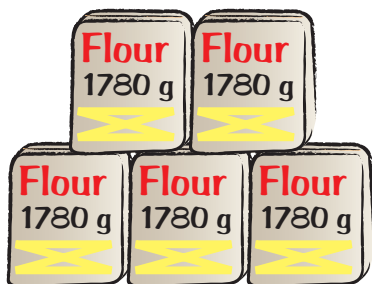
Flour 1780 g | Flour 1780 g
Flour 1780 g | Flour 1780 g | Flour 1780 g

b)

Rice 2348 g
Rice 2348 g | Rice 2348 g

c)

Detergent 3760 g | Detergent 3760 g
Detergent 3760 g | Detergent 3760 g

d)

Salt 2156 g | Salt 2156 g
Salt 2156 g | Salt 2156 g

e)

Sugar 2865 g | Sugar 2865 g | Sugar 2865 g
Sugar 2865 g | Sugar 2865 g | Sugar 2865 g | Sugar 2865 g

Try this

Use these digits.

6   7   3   8   5

Arrange the digits to make a multiplication like this:

☐ ☐ ☐ ☐
                    ☐
× _____

_____

a) Arrange the digits to make the largest product.
b) Arrange the digits to make the smallest product.
c) Arrange the digits to make the product as close to 30 000 as possible.

Multiplying by tens

Remember that to multiply any number by 10, the number is moved one place to the left and a zero is put at the end.

$135 \times 10 = 1350$

Th	H	T	U
	1	3	5
1	3	5	0

$\times$ 10

This can help you multiply numbers by 20, 30, 40 and so on.

Example

48×30

To multiply by 30, first multiply by 3 and then multiply by 10.

Step 1

$48 \times 30 = 48 \times 3 \times 10$

$48 \times 30 = 1440$

Step 2

$$\begin{array}{r} 4\ 8 \\ \times\ 3 \\ \hline 1\ 4\ 4 \\ 2 \end{array}$$

Step 3

$144 \times 10 = 1440$

1 Multiply by 10 and write the answers.

a) $47 \times 10 =$ b) $64 \times 10 =$ c) $73 \times 10 =$

d) $16 \times 10 =$ e) $50 \times 10 =$ f) $96 \times 10 =$

2 Complete the steps to multiply each of these.

a) To multiply by 20, first multiply by _____ and then multiply by _____
$43 \times 20 =$

b) To multiply by 50, first multiply by _____ and then multiply by _____
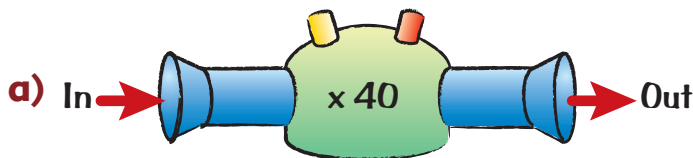$21 \times 50 =$

c) To multiply by 40, first multiply by _____ and then multiply by _____
$54 \times 40 =$

d) To multiply by 30, first multiply by _____ and then multiply by _____
$67 \times 30 =$

3 Answer these.

a) 32 × 30   **b)** 15 × 50   **c)** 62 × 40   **d)** 28 × 40

e) 37 × 30   **f)** 47 × 50   **g)** 34 × 20   **h)** 62 × 50

4 These function machines multiply. Complete the tables of results for the numbers coming out of each function machine.

a) In → x 40 → Out

IN	23	37	51	80	96
OUT					

b) In → x 30 → Out

IN	18	41	65	72	90
OUT					

Try this

a) There are 60 minutes in an hour. How many minutes in 10 hours?

b) 485 people go to a basketball game and tickets cost $10.
How much money in total will be taken from ticket sales?

c) Steven measures the length of his classroom with 30 cm rulers. He lays down 17 rulers. What is the length of his classroom in centimetres?

d) A car travels 16 km per litre of petrol. It has 20 litres of petrol in the tank. How far can it travel?

e) A cup holds 50 ml of water. It takes 64 cups to fill a bucket.
How much water is in the bucket when it is full?

f) A brick is 20 cm long. A wall is made using a row of 78 bricks.
What is the length of the wall?

Multiplying 2-digit by 2-digit numbers

To work out a multiplication such as 34 × 26 you need to be able to multiply multiples of 10.

Look at these two methods:

Method 1

×	30	4
20	600	80
6	180	24

→ 680

→ + 204

884

Method 2

```
      3 4          →  leading to  →        3 4
    ×  2 6                               ×  2 6
      8 0   (20 × 4)                      2 0 4   (34 × 6)
    6 0 0   (20 × 30)                     6 8 0   (34 × 20)
      2 4   (6 × 4)                        8 8 4
    1 8 0   (6 × 30)
    ─────
    8 8 4
```

1 Use Method 1 to complete these multiplications.

a) 19 × 76 =

×	10	9
70		
6		

→ ....

→ + _____

b) 84 × 37 =

×	80	4
30		
7		

→ ....

→ + _____

c) 28 × 55 =

→ ....

→ + _____

d) 62 × 43 =

→ ....

→ + _____

2 Use Method 2 to complete these multiplications.

a)

```
    1 9
  ×  2 4
  _____
```

b)

```
    5 3
  ×  6 2
  _____
```

c)

```
    3 8
  ×  4 6
  _____
```

d)

```
    7 7
  ×  3 5
  _____
```

e)

```
    1 9
  ×  5 8
  _____
```

f)

```
    3 5
  ×  9 2
  _____
```

Try this

Read and answer these.

a) What is 45 multiplied by 16?

b) Multiply 29 by itself.

c) What number is 34 times greater than 51?

d) What is the product of 42 and 57?

e) What is 90 multiplied by 26?

f) What is 67 times 26?

Multiplying 3-digit by 2-digit numbers

Example 1

```
    2 1 6
×     1 4
    8 6 4    (216 × 4)
  2 1 6 0    (216 × 10)
  3 0 2 4
```

Example 2

```
    4 3 5
×     1 7
  3 0 4 5    (435 × 7)
  4 3 5 0    (435 × 10)
  7 3 9 5
```

1 Complete these multiplications.

a)
```
  3 2 4
×   1 2
```

b)
```
  4 0 9
×   1 8
```

c)
```
  4 3 5
×   1 9
```

d)
```
  2 1 7
×   2 6
```

e)
```
  1 5 2
×   2 5
```

f)
```
  2 3 6
×   2 7
```

2 Complete these.

a)
```
    3   6   ☐
×           2   7
    2   5   ☐   5
  ☐     3   0   0
    9   8   ☐   5
```

b)
```
            6   ☐   2
×               1   ☐
    3   ☐   6   0
    6   3   2   0
  ☐     4   8   0
```

c)
```
        ☐   0   8
×           2   2
      8   1   ☐
    8   1   ☐   0
    8   ☐   7   6
```

d)
```
        4   ☐   ☐
×           1   8
    3   9   3   6
    4   9   ☐   0
    8   8   ☐   6
```

3 Answer these.

a) A factory makes 137 toys an hour. The machines work for a full 12-hour day. How many toys are made in a full day?
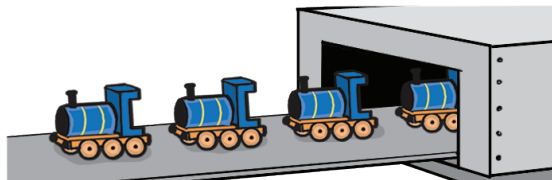
b) Small steel girders weigh 484 kg each. What is the total weight of 15 girders?

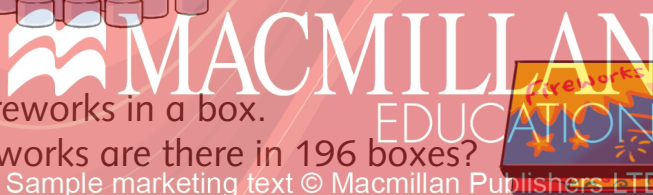**c)** A complete football kit cost $167. How much would it cost to buy 13 kits for a team with two substitutes?

**d)** There are 32 pieces on a chess set. How many pieces on 150 chess sets?

e) A bottle of water holds 334 ml. How much will 18 bottles hold?

f) There are 18 fireworks in a box. How many fireworks are there in 196 boxes?

g) Sophie saves $256 a month. How much will she save in a year?

h) At a football stadium there are 285 seats in a row and there are 27 rows. How many people can be seated to watch a football match?
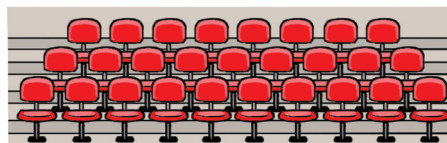
Try this

1 Egypt pound (EGP) = 275 Lebanon pounds (LBP)
How much would the following cost in Lebanon pounds?

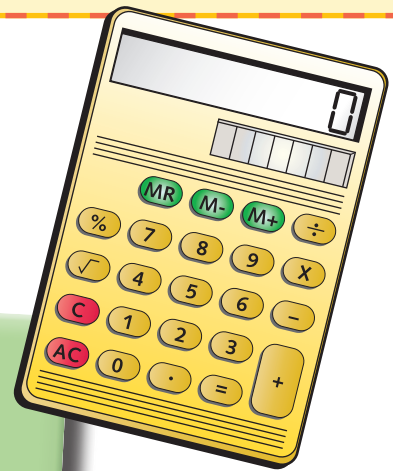**a)** 64 EGP

b) 57 EGP

c) 38 EGP

Calculator patterns

When numbers are multiplied together, there are often patterns in the results..

Use a calculator or pencil and paper to work these out.

Write about the patterns you find.
Do the patterns continue?

a)
143 × 7 × 1
143 × 7 × 2
143 × 7 × 3
143 × 7 × 4

b)
6 × 7
66 × 67
666 × 667
6666 × 6667

c)
1 × 9 + 2
12 × 9 + 3
123 × 9 + 4
1234 × 9 + 5

d)
1 × 8 + 1
12 × 8 + 2
123 × 8 + 3
1234 × 8 + 4

e)
37 × 3
37 × 33
37 × 333
37 × 3333

f)
91 × 44
91 × 444
91 × 4444
91 × 44 444

1 These function machines multiply. Complete the tables of results for the numbers coming out of each function machine.

a)

In → **× 60** → Out

IN	12	29	48	60	93
OUT					

b)

In → **× 80** → Out

IN	174	955	407	520	800
OUT					

2 A company owns six lorries. Each lorry has a maximum number of crates it can carry.
Complete this chart.

Lorry	Maximum number of crates			
	1 journey	18 journeys	25 journeys	32 journeys
A	28			
B	52			
C	47		1175	
D	36			
E	64	1152		

3 Answer these.

a)
$$\begin{array}{r} 378 \\ \times\ 11 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 347 \\ \times\ 23 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 510 \\ \times\ 18 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 656 \\ \times\ 13 \\ \hline \end{array}$$