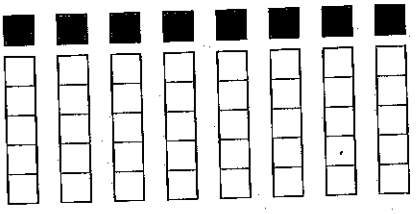
Using Compensation From Known Facts

$6 \times 6 = \square$
$6 \times 5 = 30 + 6$
$6 \times 6 = \mathbf{36}$



$6 \times 68 = \square$
$6 \times 70 = 420$
so $6 \times 68 = 420 - 12$
$= \mathbf{408}$

Use compensation to solve these multiplication equations.

1 $78 \times 4 =$ **2** $47 \times 8 =$ **3** $39 \times 6 =$

4 $328 \times 3 =$ **5** $247 \times 6 =$ **6** $498 \times 7 =$

Using Standard Partitioning

$213 \times 3 = \square$

$200 \times 3 = 600$
$10 \times 3 = 30$
$3 \times 3 = 9$

$213 \times 3 = 600 + 30 + 9 = \mathbf{639}$

$345 \times 4 = \square$
$300 \times 4 = 1200$
$40 \times 4 = 160$
$5 \times 4 = 20$
$1200 + 160 + 20 = \mathbf{1380}$

Use standard partitioning to solve these multiplication equations.

1 $456 \times 7 =$ **2** $326 \times 6 =$ **3** $538 \times 3 =$

4 $472 \times 8 =$ **5** $683 \times 4 =$ **6** $738 \times 7 =$

Choose a Method

Solve each of these questions in at least two different ways.

1 $256 \times 5 =$ **4** $298 \times 5 =$

Written Working Form

Sometimes numbers are too big or untidy to solve an equation mentally, so a written working form can be used.

276	
x 7	
42	(6 x 7)
490	(70 x 7)
1400	(200 x 7)
1932	

This is the same as using standard partitioning except the numbers are written in a vertical format.

Use a standard written form for these equations.

1	436 × 8	**2**	268 × 6	**3**	632 × 4	**4**	374 × 7
5	427 × 5	**6**	529 × 3	**7**	475 × 8	**8**	259 × 6
9	821 × 4	**10**	382 × 9	**11**	3546 × 4	**12**	6386 × 5
13	4293 × 6	**14**	2158 × 3	**15**	6218 × 7	**16**	4327 × 8
17	1976 × 2	**18**	2345 × 9	**19**	3427 × 6	**20**	2765 × 7

Challenge

Discuss with your group what methods you could use to solve these equations. Try to find at least two different ways of solving each equation.

1. **34 × 49 =**
2. **72 × 98 =**
3. **372 × 50 =**
4. **12 × 424 =**
5. **51 × 236 =**

Story Problems

Multiplication is often used in real-life situations.
Choose an appropriate method to solve these story problems.

1 The vet gave a cat five injections over one week.
Each injection was 115mL of medicine.
How much medicine did the cat receive in the week?

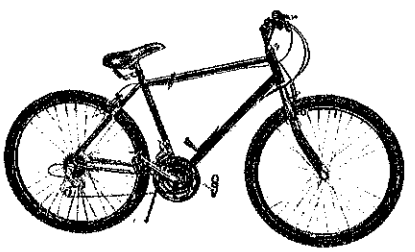
2 Mrs Moke took her dog to the vet. She lives 98km from the vet. She had to make the journey, there and back, three times. How many kilometres did she travel?

3 Last year Mr Tiki took his dog to the vet four times. Each time the vet's bill was $136. How much did Mr Tiki spend at the vet's last year?

Multiplication is often used along with another operation to reach the answer.
Read these story problems and decide which operation you can use to give the answer.
Some problems require a combination of operations — to solve the problem you will need to decide which order the operations need to be done in.

4 Carla wanted to buy a new cage costing $99 for her rabbit.
She earns $15.50 a week. How many weeks does she need to save to buy the new cage?

5 Greg cycled from home to the vet centre 41 weekends during the year.
He lives 9km from the centre. How many kilometres did he travel?



6 Greg cycles at 1km every 5 minutes.

- **a** How many minutes has Greg spent cycling during the year?
- **b** How long is this in hours and minutes?
- **c** How long is this in days, hours and minutes?

7 Tyler worked 6 hours a week for 36 weeks in the year.

- **a** How many hours did she work?
- **b** If she earned $8 per hour, how much has she earned?

8 Tyrone worked 5 hours a week for 42 weeks in the year.

Double-Digit Multiplication

We can use our knowledge of **area** to help us with double-digit multiplication.

Imagine a rectangle measuring 56cm by 38cm.
The area of the rectangle would be found by 56 × 38.
Partition each of the measurements into tens and ones.

	50	6
8	50 × 8	8 × 6
30	50 × 30	30 × 6

The area of each part of the rectangle can be shown as a separate multiplication.
The area of the whole is then found by adding each part.

50 × 30 = 1500
50 × 8 = 400
30 × 6 = 180
8 × 6 = 48

The total area is 1500 + 400 + 180 + 48 = 2128

56 x 38 = 2128

Draw these rectangles and calculate the multiplications.

1 65 × 23 = **2** 84 × 32 = **3** 47 × 27 = **4** 94 × 35 = **5** 28 x 75 =

6 34 × 87 = **7** 29 × 55 = **8** 43 × 64 = **9** 86 × 62 = **10** 73 x 53 =