1 In the warehouse – DIY 4 ALL

I work in the warehouse of a big *do-it-yourself* shop. I like it because there's lots of variety in the things I have to do and I meet a lot of people.

There are deliveries to be checked in and shelves to be stacked. Customers' orders have to be processed, loaded into the vans and delivered.

Do I use numbers in my job? Well, I have to recognise the stock numbers of all the things we sell and I have to count how much stock there is. I need to check how many items there are in each packing case and what will fit on to the shelves in the warehouse. I organise the deliveries, so I need to work with distances. So, yes, I use numbers every day.

Talk about it

Do you ever do any DIY?

Do you ever go to big DIY shops?

Do you ever have to pack or stack things?

Have you planned a journey and thought about the distance?

What maths skills do you think you might need for these tasks?

These are the skills you will practise in this unit.

Which are the most useful for you? Tick the boxes.   **Skill code**

☐ Using, **adding** and **subtracting** numbers up to 1000   N1/E3.1, 2, 9

☐ **Multiplying** and **dividing** two digits by one digit   N1/E3.4, 6, 9

☐ **Approximating** numbers and **estimating** answers   N1/E3.7, 8

☐ Understanding miles and kilometres as **distances**   MSS1/E3.4

☐ Sorting mathematical **shapes**   MSS2/E3.1

Getting things in the right order

> It's a big warehouse. When I put an order together for a customer, I have to use the stock code numbers. Everything has a different number. I start at one end of the warehouse where the lowest stock codes are and work my way to the other end where the highest stock codes are.

The things Mrs Brown wants are shown below. The list on the right has the same items as the list on the left, but the order has been changed so that the stock code numbers are in **ascending order**.

Ascending order means that the numbers are arranged with the lowest number first e.g.

1, 2, 3, 4, 5

or 100, 102, 106, 153.

For Mrs Brown's order, the lowest stock number is 450, the next lowest is 746 and so on.

DIY 4 ALL

Customer name and address:
Mrs Brown, 4 Hawthorn Gardens, Hambledon.

Stock code	Description	Price
746	Blue paint	
928	Pale blue wallpaper	
907	Paste	
450	Brush	

DIY 4 ALL

Customer name and address:
Mrs Brown, 4 Hawthorn Gardens, Hambledon.

Stock code	Description	Price
450	Brush	
746	Blue paint	
907	Paste	
928	Pale blue wallpaper	

Activity 1

Here is an order form for Mr Taylor. Sort the items into ascending order of stock code numbers.

DIY 4 ALL

Customer name and address:
Mr Taylor, Unit 12, Cornley Estate

Stock code	Description	Price
744	Dark green paint	
730	Light green paint	
792	White paint	
248	Roller	
324	Tray	
951	Mint wallpaper	
836	Border	
907	Paste	

DIY 4 ALL

Customer name and address:
Mr Taylor, Unit 12, Cornley Estate

Stock code	Description	Price
248	Roller	
....	....	
....	....	
....	....	
....	....	
....	....	
....	....	
....	....	

Tip

Sorting numbers

384 = 300 + 80 + 4 = 3 hundreds + 8 tens + 4 units

306 = 300 + 00 + 6 = 3 hundreds + 0 tens + 6 units

So 306 is lower because it has the same number of hundreds, but fewer tens.

In sequence

When I'm looking for a stock item in the warehouse and I see number 227, I know that 127 will be in the aisle before and 327 will be in the aisle after.

The numbers go in **sequence**: 127, 227, 327, 427 etc.

Can you continue the sequence? Talk about sequences in your group.

Think about places where numbers are used in order or in sequence.

Activity 2

1   Fill in the missing numbers in the following sequences.

a   10   20   30   60   100

b   13   23   33   43   73   103

Check your answers before going on.

c   98   88   78   48   8

d   100   200   300   600   1000

e   137   237   337   637   937

f   952   852   752   452   52

2   These sequences have been jumbled up. Put the numbers back in **ascending** order. You will find it helpful to cross out a number when you have put it in the right place.

a   ~~25~~   65   ~~5~~   45   95   85   55   ~~15~~   35   75

     5   15   25   ....

b   91   11   81   71   21   1   41   51   61   31

     ....

c   145   645   245   545   945   845   345   445   745

     ....

3   Put these numbers into **descending** order.

     384   184   684   984   584   284   784   484   884

     ....

Remember
- **Ascending** means from lowest up to highest.
- **Descending** means from highest down to lowest.

Address the order

Today one of the vans is delivering goods along Great Western Road.

Which would be the best order to make the stops?

Activity 3

Here are the order forms for goods that have to be delivered in Great Western Road. Write the addresses in **ascending** order of house number.

B. Bridges, 384 Great Western Road

D. Sangster, 851 Great Western Road

Car Kits, 225 Great Western Road

Mo's Muncher, 309 Great Western Road

Akrams, 492 Great Western Road

Cut & Curl, 348 Great Western Road

S. Davies, 94 Great Western Road

Able Alarms, 467 Great Western Road

A.Crosby, 122 Great Western Road

Sports United, 326 Great Western Road

M. Watson, 175 Great Western Road

E. McKenzie, 59 Great Western Road

DIY 4 ALL

1 ....

2 ....

3 ....

4 ....

5 ....

6 ....

7 ....

8 ....

9 ....

10 ....

11 ....

12 ....

Odds and evens

Think about a street you often walk along.

How are the houses or shops arranged?

How does the postal worker know which house is which?

Which numbers are **odd** and which are **even**?

Odd numbers end in 1, 3, 5, 7 or 9. Even numbers end in 0, 2, 4, 6 or 8.

For example, 64**1** is an odd number and 64**2** is an even number.

> *Tomorrow I'm delivering stock along the High Street. The traffic is really busy, so it's best to deliver to all the odd numbers along one side first and then come back down the other side starting with the highest even number.*

Activity 4

Put the addresses in order for the High Street deliveries – odd numbers in ascending order first, followed by even numbers in descending order.

DELIVERIES — DIY 4 ALL
N. Garth. 47 High Street

DELIVERIES — DIY 4 ALL
ABC Writers, 196 High Street

DELIVERIES — DIY 4 ALL
S. Beck, 88 High Street

DELIVERIES — DIY 4 ALL
L. Pegram, 265 High Street

DELIVERIES — DIY 4 ALL
International Inc, 123 High Street

DELIVERIES — DIY 4 ALL
McKie's, 181 High Street

DELIVERIES — DIY 4 ALL
Trelims Ltd., 224 High Street

DELIVERIES — DIY 4 ALL
M. Heads, 52 High Street

1 ....

2 ....

3 ....

4 ....

5 ....

6 ....

7 ....

8 ....

Remember
- Odd numbers end in 1, 3, 5, 7 or 9.
- Even numbers end in 0, 2, 4, 6 or 8.

Review

Do you need more practice in putting numbers in order, sequencing or understanding odd and even numbers?

Yes ☐   No ☐

For more work on this, go to H1, H2 and H3 (page 20) or E1 (page 22).

Paying by cheque

> *Customers have to pay for an order when it is delivered. If they write a cheque I have to make sure that the amount of money is correct and that the amount in words is the same as the amount in figures.*

Have you used cheques to pay for goods or services?

Look at the cheque below. In your group talk about how it has been completed.

```
                                              20-34-01
                                          800908 82232579
                           DATE  6th Jan 2003

PAY   DIY 4 ALL
one hundred and forty-three pounds        £ 143.52
and fifty-two pence only                       N GARTH

                                          N Garth

Cheque No.        Sort Code      Account No.
"100257"        50"9870"      92257118
```

Activity 5

1 Complete these cheques with the missing amounts in numbers or in words.

a
```
                                              55-12-12
                                          100908 65874125
                       DATE  12th Feb 2003

PAY  DIY 4 ALL
                                    £   156.75
                                         L PEGRAM

                                    L Pegram

Cheque No.      Sort Code      Account No.
"911267"      01"5872"      84266328
```

b
```
                                              99-02-05
                                          548511 65874568
                              DATE  18th March 2003

PAY  DIY 4 ALL
                                    £   236.00
                                         M HEADS

                                    M Heads

Cheque No.      Sort Code      Account No.
"524789"      11"5478"      74723655
```

c
```
                                              21-04-55
                                          858630 78452147
                    DATE  24Th Apr 2003

PAY  DIY 4 ALL
                                 £   465.20
                                      S BECK

                                 S Beck

Cheque No.      Sort Code      Account No.
"356875"      05"5874"      98745008
```

d
```
                                              00-29-65
                                          658505 10235003
                          DATE  30th May 2003

PAY  DIY 4 aLL
seven hundred and six pounds       £
and 50 pence only
                                        G MCKIE

                                   G McKie

Cheque No.      Sort Code      Account No.
"025889"      45"5657"      45689778
```

e
```
                                              05-77-89
                                          658758 25568798
                      DATE  22nd Aug 2003

PAY  DIY 4 ALL
                              £ 573.43
                                   S DAVIES

                              S Davies

Cheque No.      Sort Code      Account No.
"689600"      11"6458"      32564550
```

f
```
                                              25-99-20
                                          547854 44005228
                      DATE  29th June 2003

PAY   DIY 4 ALL
Three hundred and twenty-nine pounds  £
and 14 pence only
                                        A CROSBY

                                   A Crosby

Cheque No.      Sort Code      Account No.
"658210"      00"1451"      85472014
```

g

50-18-78
245654 35478562

DATE 19th Sept 2003

PAY DIY 4 ALL

Six hundred and fourteen pounds

and 61 pence only

£

N AKRAM

N Akram

Cheque No.   Sort Code   Account No.

"235645"   99"5687"   12458789

h

23-58-52
256245 53689547

DATE 25th July 2003

PAY DIY 4 ALL

Eight hundred and eighty-two pounds

and 37 pence only

£

E WATSON

E Watson

Cheque No.   Sort Code   Account No.

"456850"   10"6525"   12321458

---

2 Look at these two cheques. The amount in words is incorrect. Write the correct amount in words underneath each.

a

57-84-11
356214 55886541

DATE 16th Oct 2003

PAY DIY 4 ALL

Thirty-six pounds and 40 pence

only

£ 306.40

B BRIDGES

B Bridges

Cheque No.   Sort Code   Account No.

"065897"   22"6532"   25600112

b

05-77-89
658758 25568798

DATE 13th Nov 2003

PAY DIY 4 ALL

one hundred and fourteen pounds

50 pence only

£ 140.05

D SANGSTER

D Sangster

Cheque No.   Sort Code   Account No.

"689600"   11"6458"   32564550

....

....

---

3 Look at these two cheques. The amount in figures is incorrect. Write the correct figures underneath.

a

25-99-20
547854 44005228

DATE 10th Dec 2003

PAY DIY 4 ALL

Five hundred and two pounds and

10 pence only

£ 52.10

A KNIGHT

A Knight

Cheque No.   Sort Code   Account No.

"658210"   00"1451"   85472014

b

91-22-07
325648 25689785

DATE 3rd March 2003

PAY DIY 4 ALL

Two hundred and nineteen pounds

and 24 pence only

£ 219.42

M MUNCHER

M Muncher

Cheque No.   Sort Code   Account No.

"211565"   58"6589"   54755874

....

Review

Do you need more practice in writing numbers in figures and in words?   **Yes** ☐ **No** ☐

For more work on this, go to H4 (page 20).

Approximately

Talk about it

Can you make up a sentence with the word 'approximately' in it?
– Approximately how many chairs are in the room?
– Approximately how many steps does it take to get to the top floor of a ten-storey block of flats?
– Approximately how many days or weeks are there until December 31?

Did you give 'round' numbers in your answers?

> **Tip**
> ● A **round** number often ends with the round figure 0 or sometimes 00.

43 is approximately 40, **rounded** to the nearest 10.
It is rounded to 40 because 43 is closer to 40 than to 50.
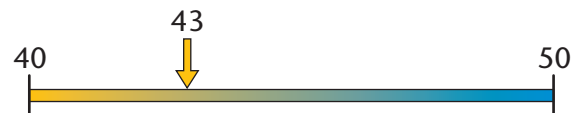
47 is approximately 50, rounded to the nearest 10.
It is rounded to 50 because 47 is closer to 50 than to 40.
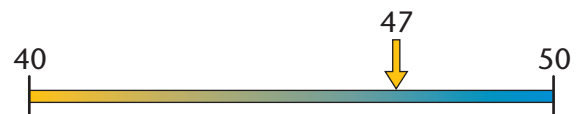
> Sometimes the DIY manager asks approximately how much of a certain item is in stock. She wants to know if there is plenty of stock, or if it is nearly time to order more. The manager is asking for a number to the nearest 10.

Activity 6

Round these paint stock numbers to the nearest 10.

1 53 tins of blue paint is approximately ....50............ tins.

2 28 tins of green paint is approximately .... tins.

3 46 tins of yellow paint is approximately .... tins.

4 35 tins of indigo paint is approximately .... tins.

5 67 tins of lilac paint is approximately .... tins.

6 81 tins of peach paint, rounded to the nearest 10 is .... tins.

7 74 tins of cream paint, rounded to the nearest 10 is .... tins.

8 92 tins of white paint, rounded to the nearest 10 is .... tins.

9 19 tins of cerise paint, rounded to the nearest 10 is .... tins.

> **Tip**
> **Rounding to the nearest 10**
> ● Numbers ending in 0, 1, 2, 3 and 4 are rounded to the 10 below.
> ● Numbers ending in 5, 6, 7, 8 and 9 are rounded to the 10 above.

For larger amounts such as 676 or 939, we **approximate** by **rounding** to the **nearest 100**.

676 is approximately 700, rounded to the nearest 100. It is rounded to 700 because 676 is closer to 700 than to 600.

939 is approximately 900, rounded to the nearest 100. It is rounded to 900 because 939 is closer to 900 than to 1000.

676
600   700

939
900   1000
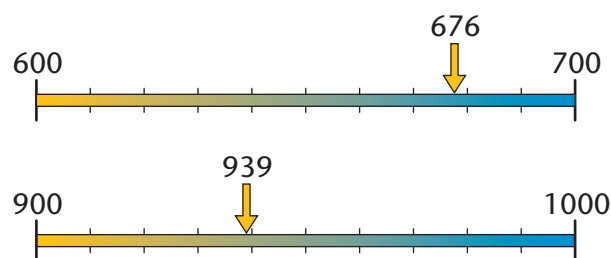
Activity 7

Round these tile stock numbers to the nearest 100. Remember to look at the last **two digits** of the number to help you decide how to round it. You may find it helpful to cover the hundreds digit with your finger.

Tile pattern	Number in stock	Number in stock rounded to the nearest 100
Daisy	268	300
Shell	518	
Fish	136	
Star	375	
Leaf	666	
Swirl	372	
Bubbles	419	
Ribbon	185	
Corn	250	

Tip

Rounding to the nearest 100

- For numbers ending in **01 to 49**, go to the 100 below.
- For numbers ending in **50 to 99**, go to the 100 above.

Review

Do you need more practice rounding numbers? Yes ☐ No ☐

For more work on this, go to H5 (page 21).

Adding to the stock

When deliveries arrive at DIY 4 All, *the new stock is added to the old stock to give a new total.*

For example, if there are 75 rolls of meadow pattern wallpaper in stock and another 240 rolls are delivered, then the new stock total is 75 + 240 = 315 rolls.

To work this out, it helps to think about hundreds, tens and units.

Remember

240 means 200 + 40 + 0

75 means 70 + 5

$$
\begin{array}{r}
\text{H} \qquad \text{T} \quad \text{U} \\
200 + \ 40 + \ 0 \\
\text{add} \quad \underline{\qquad 70 + \ 5} \\
200 + 110 + \ 5 = \ \underline{315}
\end{array}
$$
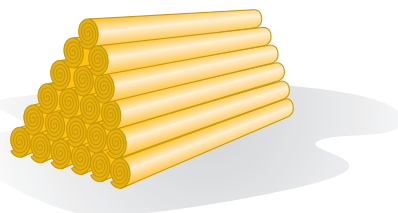
Talk about it

● How do you add up in your head? How do you write it down?

Activity 8

Practise by adding the deliveries of wallpaper to the stocks.

Wallpaper pattern	Number of rolls in stock	Number delivered	Total
Poppy	146	72	
Stripe	65	230	
Floral	114	425	
Scroll	218	124	
Wave	142	375	
Train	136	180	
Swirl	19	380	
United	245	245	
Birds	153	77	
Fern	307	108	
Feather	256	248	

Poppy

$$
\begin{array}{r}
\text{H} \qquad \text{T} \qquad \text{U} \\
100 + 40 + 6 \\
\text{add} \quad \underline{\qquad 70 + 2}
\end{array}
$$

Tip

For written calculations, keep the hundreds, tens and units in columns **H T U**

Are you right?

When you do a sum, how do you know the answer is right? How can you check your calculations?

Try to think of different ways of checking. Talk about it in your group.

One way of checking is by making an **estimate** or an **approximate** answer first, to see the **size** of answer to expect.

> *If there are 83 tins in stock (that's approximately 100) and another 235 (that's approximately 200) are delivered, then my total is approximately 100 + 200 = 300. Easy!*
> $$83 + 235 = 318$$
> *Quite close to my estimate, so I think I'm right.*

Activity 9

Work with another person. Take turns to do the estimate and then the calculation.

	Estimate	Exact answer	Space for working out
1 315 + 122	300 + 100 = 400	437	
2 483 + 516			
3 266 + 632			
4 375 + 254			
5 294 + 614			
6 426 + 384			
7 490 + 88			
8 327 + 284			
9 79 + 843			

Review

Do you need more practice in rounding and adding numbers with three digits?

Yes ☐ No ☐

For more work on this, go to H6, questions 1–6 (page 21).

Taking stock away

When customer orders are taken from the stock, I have to calculate how much stock is left.

If I take 160 away from 576, I get exactly 416.

Talk about it

When do **you** use **subtraction**? How do you subtract in your head? How do you write it down? Share your methods in your group. Think about how you can get an approximate answer.

$576 - 160 =$ **approximately** $600 - 200 = 400$

	H	**T**	**U**
	500 +	70 +	6
subtract	100 +	60 +	0
	400 +	10 +	6 = 416

You can check a **subtraction** by doing an **addition**.

Add 160 and 416. What do you get?

If you get back to 576, you know your subtraction is correct.

Activity 10

Here are some orders picked from stock this month.
Work out how much stock is left. Don't forget to check your answers.

*When orders come in to DIY 4 All, the items are picked from stock. You can work out how much is left by **subtraction**.*

Door handles	Starting stock	Stock picked	Stock left
Large mahogany	475	231	244
Medium mahogany	568	333	
Small mahogany	356	215	
Large beech	640	235	
Medium beech	347	162	
Small beech	241	175	
Large ash	205	63	
Medium ash	327	188	
Small ash	402	276	

	H	**T**	**U**
	300 +	40 +	7
subtract	100 +	60 +	2

We need some more tens.

	H	**T**	**U**
	200 +	140 +	7
subtract	100 +	60 +	2
	100 +	80 +	5 = 185

Review

Do you need more practice in subtraction? Yes ☐ No ☐

For more work on this, go to H6, questions 7–12 (page 21).

How many in a case?

Stock comes to the shop in all sorts of sized packets! Paint brushes come in packs of five. Tins of paint come in eights if they are small ones, and in fours if they are large ones. Things that come in plastic wrap can have any number – whatever will wrap easily. Curtain poles come in sevens! When the supervisor wants to know how many we have in stock, I have to count in these numbers – I have to know the **multiples**.

Count items in twos like this   2, 4, 6, _8_ , 10, 12 , 14, 16.

Count items in fives like this   5, 10, 15, 20, 25, 30, 35, 40.

🎧 Activity 11

Count the multiples to complete this check on stock. (You may need to use a tables square or a calculator.)

Stock item	
Paint brushes in fives	5, 10, 15, 20, ..., ..., ..., ..., 45, ..., ..., ..., 65
Tins of paint in eights	8, 16, 24, 32, ..., ..., ..., 64, ..., ..., ..., 96
Curtain poles in sevens	7, 14, 21, ..., ..., ..., 49, ..., ..., ..., 77
Fence posts in nines	9, 18, 27, ..., ..., 54, ..., ..., ..., 90, ...
Packs of nails in 100s	100, 200, 300, ..., ..., ..., ..., 800, ..., ...
Packs of door knobs in 50s	50, 100, 150, 200, ..., ..., ..., 400, ..., ..., 550
Boxes of work gloves in 20s	20, 40, 60, ..., ..., ..., 140, ..., ..., 200, ...
Rolls of wallpaper in 25s	25, 50, 75, ..., ..., ..., 175, ..., ..., 250, ...

Can you describe the patterns? Talk about them in your group.

🔄 Review

Do you need more practice in multiplying two-digit numbers by one-digit numbers?

Yes ☐   No ☐

For more work on this, go to H7 (page 21) or E3 and E4 (page 22).

This work links to mini-project M1 (page 23).

Paint stocks

In the DIY 4 All warehouse we receive small tins of paint in packing cases of 36 tins. To find out how many tins are in four packing cases, I have to **multiply** 36 by 4.

In four packing cases there are $36 \times 4 = 144$ tins.

There are other ways of working this out.

$36 = 30 + 6$

So
$$30 \times 4 = 120$$
$$6 \times 4 = 24$$

then add $\quad 36 \times 4 = 144$

H	T	U
	3	6
×	₂	4
1	4	4

Talk about it

How do you multiply? How do you multiply in your head? How do you write it down?

Activity 12

Calculate how many of each paint colour and size there are in stock.

Small: 36 tins per case		Medium: 24 tins per case		Large: 16 tins per case	
Cases	Tins	Cases	Tins	Cases	Tins
2 red	$36 \times 2 = 72$	3 red		5 red	
4 blue		6 white	$24 \times 6 =$	7 blue	
8 white		7 white		9 white	

Small red

H	T	U
	3	6
×		2
	7	2

Medium white

H	T	U
	2	4
×		6

Space for working

Talk about it

How can you check that your multiplying is correct? You could use a calculator.

If you have access to a computer, you could use a spreadsheet.

What other methods can you use? What about reversing the calculation and using division as a check?

For example, if $36 \times 5 = 180$ then $180 \div 5 = 36$. Check!

Using a calculator: [3] [6] [×] [5] [=] | 180 |

Then, to **check** the answer:

[1] [8] [0] [÷] [5] [=] | 36 |

Or, you could use estimation again.

36 is approximately 40, rounded to the nearest 10.

$40 \times 5 = 200$ so that means the answer 180 is the right size, since it is close to 200.

There are lots of different ways of checking multiplication.

Activity 13

Try out some of the methods. Work with another person to calculate and check these wallpaper stocks.

Wallpaper patterns	Stock	Space for working
Orchard	14 boxes of 8 rolls = ... rolls	
Fruit	35 boxes of 8 rolls = ... rolls	
Grapes	72 boxes of 6 rolls = ... rolls	
Circles	64 boxes of 6 rolls = ... rolls	
Spirals	58 boxes of 4 rolls = ... rolls	
Spots	29 boxes of 4 rolls = ... rolls	
Squares	53 boxes of 6 rolls = ... rolls	
Nursery	27 boxes of 8 rolls = ... rolls	

Review

Do you need more practice in multiplying?　　Yes [ ]　No [ ]

For more work on this go, to H8 (page 21) or E2, E3 and E4 (page 22).

Packing up

If a customer orders 20 tiles, I need to know how many boxes of tiles to collect from the warehouse. Some come in boxes of five, but others come in boxes of two, or three or four.

DIY4ALL

Customer name and address:
Mrs Brown, 4 Hawthorn Gardens, Hambledon.

Stock code	Description	Price
	20 leaf pattern tiles	
	26 daisy pattern tiles	

Leaf pattern tiles come in boxes of 5.
So I need to work out $20 \div 5$.

$20 \div 5 = 4$ exactly, so four whole boxes are needed.

You can think of **division** as **repeated** subtraction, because

$20 - 5 = 15$, $15 - 5 = 10$, $10 - 5 = 5$, $5 - 5 = 0$.

That's four lots of 5.
You can check your answer by using **multiplication**: $4 \times 5 = 20$

If 26 tiles are needed and they come in boxes of 4, the calculation is
$26 \div 4 = 6$ remainder 2.

Howard will need to get 6 whole boxes, plus another 2 tiles.

$26 - 4 = 22,$
$22 - 4 = 18,$
$18 - 4 = 14,$
$14 - 4 = 10,$
$10 - 4 = 6,$
$6 - 4 = 2.$

That's six lots of 4 and 2 more.

Talk about it

You can use a calculator to help. How can you use the decimal number on the calculator to find out how many extra tiles are needed?

Try typing this into your calculator:

$\boxed{2}$ $\boxed{6}$ $\boxed{\div}$ $\boxed{4}$ $\boxed{=}$ answer $\boxed{6.5}$.

The **whole number** part is 6, so we need 6 **whole boxes**.

On the calculator type $\boxed{6}$ $\boxed{\times}$ $\boxed{4}$ $\boxed{=}$ answer $\boxed{24}$.
So we need **another 2 tiles** to make 26.

Talk about dividing calculations in your group. How do you record written calculations?

Activity 14

Work out how many full boxes and how many extra tiles are needed for these tile orders.

28 bubbles pattern tiles (boxes of 2) $28 \div 2 = 14$ 36 fish pattern tiles (boxes of 4)   ....

23 shell pattern tiles (boxes of 2)   ....   45 star pattern tiles (boxes of 4)   ....

18 corn pattern tiles (boxes of 3)   ....   64 swirl pattern tiles (boxes of 5)   ....

25 swirl pattern tiles (boxes of 3)   ....   70 wave pattern tiles (boxes of 5)   ....

Review

Do you need more practice in division?   **Yes** ☐ **No** ☐

For more work on this, go to H8 (page 21) or E2 (page 22).

How far?

Talk about it

How far can you walk in 20 minutes?

How far do you travel from home to work or home to college?

How far do you travel if you go to visit a friend or relative?

How far do you travel if you go on holiday?

What units are used to measure long distances in the UK and in other countries?

Activity 15

Here is a list of distances from *DIY 4 All* to places around Birmingham. Rank the names in order of distance from Birmingham, nearest to furthest. Use numbers to show the order.

Birmingham to

Walsall	8 miles	....
Wolverhampton	14 miles	....
Coventry	18 miles	........10.........
Bromsgrove	13 miles	....
Sutton Coldfield	6 miles	....
Smethwick	3 miles	.........1.........
Brownhills	12 miles	....
Aldridge	9 miles	....
Bilston	10 miles	....
Halesowen	7 miles	....
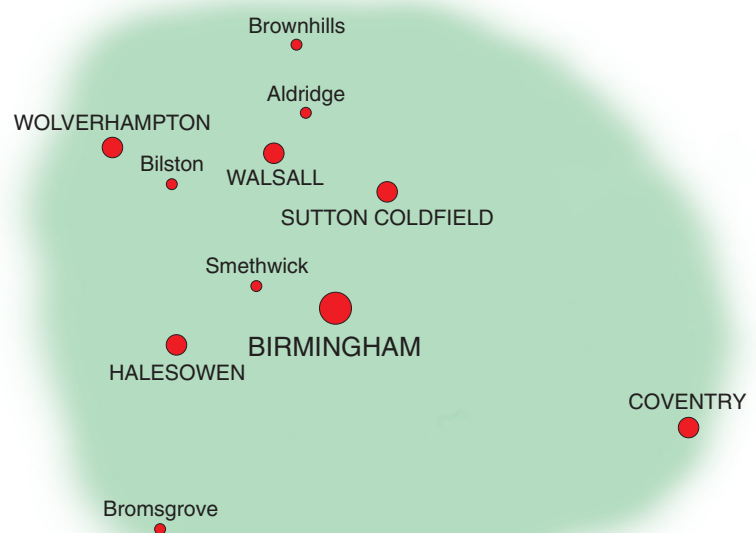
Activity 16

The distances are used to calculate delivery charges for *DIY 4 All* customers. The charge is 65p per mile. So the cost of a delivery to Aldridge is $9 \times 65p = 585p = £5.85$

Calculate the delivery charges to:

1 Halesowen ....

2 Smethwick ....

3 Sutton Coldfield ....

Review

Do you need more practice on distance? Yes ☐ No ☐

This work links to mini-project M3 (page 23).

Mathematical shapes

The items stocked at DIY 4 All come in many different shapes and sizes. Some are easy to pack and stack and others are not so easy.

Talk about it

Look around the room you are in.
Describe the shapes you see.

Which shapes have **right angles**?

Which shapes have **lines of symmetry**?

Look at tables, windows, shelves, ceiling or carpet tiles, books and paper.

Open a book and look at the different **angles** you can make between the pages.

Compare the **side lengths** of different shapes.

Activity 17

In your group, look at the picture of the *DIY 4 All* items at the top of the page.

List the shapes with right angles and those without.

Shapes with right angles	Shapes without right angles

Activity 18

Draw the lines of symmetry on these shapes.
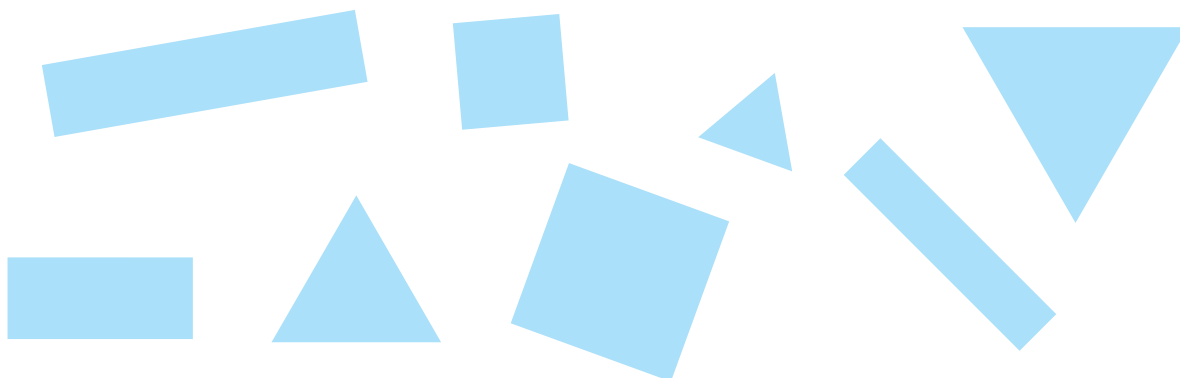
Displays

When there is a special promotion at DIY 4 All, we make a display.

20% off all tins of paint! DIY 4 ALL

Activity 19

Think about the shelves at *DIY 4 All.* Each shelf in the display area of the shop is 60 cm wide.

The tins of paint are 15 cm across.

$4 \times 15 \text{ cm} = 60 \text{ cm}$

So, four tins of paint would fit on the shelf.

Calculate how many of each item would fit on a 60 cm shelf. Make a sketch to show it. (Use separate paper.)

15 cm

PAINT

60 cm

PAINT PAINT PAINT PAINT

1 TILES
20 cm

2
30 cm

3 SPRAY ADHESIVE
10 cm

....
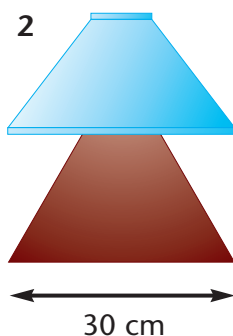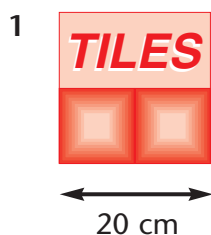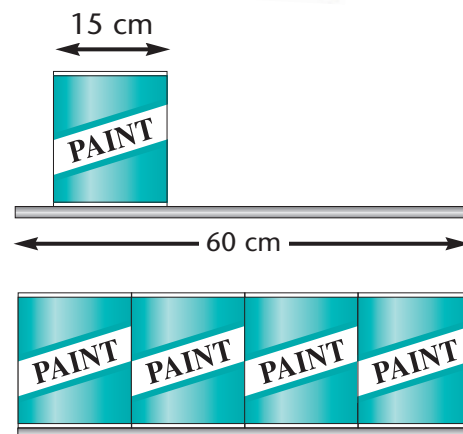
Activity 20

Use all the same shapes or a mixture of two shapes to design your own display. Try **cylinders** (cans), **cubes** or **cuboids** (boxes).

If you have access to a computer, you could use a drawing package or some of the drawing icons from the drawing toolbar.

Review

Do you need more practice in working with shapes?   **Yes** ☐   **No** ☐

For more work on this, go to H9 (page 21) or E5 (page 22).

This work links to mini-project M2 (page 23).

Help

Activity H1

Think about all the different three-digit numbers you can make with 3, 1, and 7 using each digit just once for each number.

317   713   731   371   137   173

1 Write down all the different three-digit numbers can you make with 4, 5 and 6. Use each digit once in each number.

....

2 Choose three digits of your own and make as many different numbers as you can.

What happens if one of the digits that you choose is 0?

Activity H2

1 Work with another person to put these numbers in **ascending** order.

That means lowest number first, so look for the 100s first and decide which of these is lower.

Then look at the 200s, then the 300s and so on. Cross the numbers off the list when you've put them in the right place.

468   219   ~~105~~   335   637   260   401   156   339   587   ~~132~~   200

105   132   ....

2 Put the next list in **descending** order. That means you have to find the highest number first and then the next highest, so look at the 900s first, then 800s and so on.

873   425   681   ~~999~~   ~~982~~   704   810   644   555   403   500   350

999   982   ....

Activity H3

Put a ring round all the **even** numbers in this list. Remember that even numbers end in 0, 2, 4, 6 or 8.

153   76   229   248   842   981   980   455   404   676   767

Activity H4

Draw a line to link the number in figures to the same number in words.

143	seven hundred and fifty-two	207	six hundred and nineteen
378	one hundred and forty-three	330	eight hundred and forty-eight
906	four hundred and fifty	619	two hundred and seven
752	three hundred and seventy-eight	848	five hundred and eighty-seven
450	nine hundred and six	587	three hundred and thirty

Activity H5

1 Round these distances to the nearest 10 miles.

a 47 miles is approximately ...50... miles.

b 22 miles is approximately .... miles.

c 58 miles is approximately .... miles.

d 63 miles is approximately .... miles.

e 76 miles is approximately .... miles.

f 81 miles is approximately .... miles.

2 Round these distances to the nearest 100 km (kilometres).

a 368 km is approximately ...400... km.

b 839 km is approximately .... km.

c 520 km is approximately .... km.

d 421 km is approximately .... km.

e 666 km is approximately .... km.

f 228 km is approximately .... km.

Activity H6

Some mistakes have been made in these addition and subtraction calculations.
Check them and decide which are right. Correct the ones that are wrong.

1 425 + 74 = 499

2 355 + 123 = 478

3 347 + 431 = 888

4 352 + 174 = 426

5 416 + 394 = 810

6 589 + 298 = 786

7 496 − 256 = 240

8 876 − 543 = 333

9 765 − 432 = 222

10 493 − 37 = 457

11 648 − 592 = 46

12 411 − 231 = 180

Activity H7

1 Use a calculator to find the first few multiples of 50. Add 50 each time.

Look for the pattern and continue it up to 500.

50   100   150   ....

2 Use a calculator to find the first few multiples of 100. Add 100 each time.

Look for the pattern and continue it up to 1000.

100   200   500   ....

3 Use a calculator to find the first few multiples of 25. Add 25 each time.
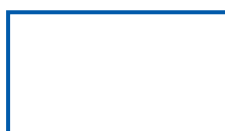
25   50   75   150   ....

Activity H8

Try these multiplication and division calculations. Work them out. Then check the
answers with a calculator.

1 How many tins of paint?

a 43 × 2   **b** 45 × 5   **c** 38 × 3   **d** 27 × 4

2 How many boxes of tiles?

a 24 ÷ 2   **b** 75 ÷ 5   **c** 64 ÷ 4   **d** 98 ÷ 3

Activity H9

Draw all the lines of symmetry
on these shapes.

Extension

Activity E1

Work with another person. Use 0, 2, 5 and 7 to make as many different three-digit numbers as you can.

You can repeat the digits, e.g. 222 or 255 or 727. They will all count.

How many of your numbers are even and how many are odd?

Activity E2

Complete the cross number.

	Across		Down
	1 16×5		**1** 43×2
	2 $69 \div 3$		**3** 13×3
	4 31×3		**5** $68 \div 2$
	6 51×5		**6** $96 \div 4$
	8 10×5		**7** 11×5
	12 107×3		**9** $99 \div 3$
			10 $84 \div 4$
			11 $90 \div 5$

Activity E3

Use a calculator or spreadsheet to investigate multiplying numbers by 10.

Start by multiplying single digits by 10, then try multiplying some two-digit numbers by 10.

Write down your answers. What do you notice about the answers? Can you write down what happens each time?

Activity E4

Use a calculator or spreadsheet to investigate multiplying numbers by 100.

Start by multiplying single digits by 100, then try multiplying some two-digit numbers by 100.

Write down your answers. What do you notice about the answers? Can you write down what happens each time?

Activity E5

If you have access to a computer, use a drawing package or the drawing toolbar to draw some three-dimensional (3-D) shapes. Draw different sizes of cubes, cuboids, cylinders and pyramids.

Mini-projects

Activity M1

1 On a 100 square, cross off or colour in all the even numbers. Notice the pattern.

Repeat this with

a multiples of 3   **b** multiples of 4   **c** other multiples.

OR

Use a 100 square.   Cross off the number 1.

Cross off all the multiples of 2, except 2 itself.

Cross off all the multiples of 3, except 3 itself

Cross off all the multiples of 5, except 5 itself.

Cross off all the multiples of 7, except 7 itself.

Make a list of all the numbers that have not been crossed through. These are special numbers called **prime numbers**. Ask your teacher about them.

Activity M2

Go to a supermarket, DIY shop or other large shop and look at the way items are stored on shelves or in special promotional displays. Draw or sketch what you have seen. How are boxes or cans stacked and displayed?

Activity M3

Find out the distances between the towns near where you live. Some maps have the distances between towns marked in miles or kilometres. Some maps have a table of distances between large towns.

Calculate how long it would take you to walk from one town to another. You can probably walk at 2 or 3 miles per hour, so divide by 3 to find the answer, or by 2 to be on the safe side. If your distance is in kilometres, then divide by 5 to find out how many hours your journey would take.

If you have access to the Internet then you can find the distance between places using the AA (Automobile Association) website www.theaa.com.

Activity M4

If you have access to the Internet, use the AA (Automobile Association) website www.theaa.com to investigate the distances between places such as London and Edinburgh, London and Cardiff, Birmingham and York – or choose some destinations of your own.

✔ Check it

🔊 Activity C1

Put these numbers in ascending order.

425   273   189   378   211   400   ~~65~~   1000   125   99   763

65   ....

🔊 Activity C2

Draw a ring around the odd numbers.

121   400   276   345   297   777   350   243   478   419   792

🔊 Activity C3

1   If there are 145 tins in stock and another 260 are delivered, how many are there altogether?

2   If 320 rolls of wallpaper are in stock and 146 are sold, how many are left?

3   If there are four tins of paint in a box and there are 45 boxes, how many tins of paint are there altogether?

4   If there are five tiles in each box, how many boxes will be needed for an order of 40 tiles?

🔊 Activity C4

Draw the lines of symmetry on the shapes and put a tick under the shapes that have right angles.
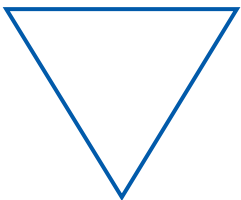
🔊 Activity C5

What is the approximate distance between London and Birmingham? Draw a ring around your answer.

2 miles   120 miles   4000 miles

How am I doing?

Now look back at the skills listed on page 1.

Then complete the sentences below.

I am confident with

....

....

I need more practice with

....

....

Date ....

Answers

Activity 1

Stock code	Description	Price
248	Roller	
324	Tray	
730	Light green paint	
744	Dark green paint	
792	White paint	
836	Border	
907	Paste	
951	Mint wallpaper	

Activity 2

1 a 10 20 30 40 50 60 70 80 90 100
  b 13 23 33 43 53 63 73 83 93 103
  c 98 88 78 68 58 48 38 28 18 8
  d 100 200 300 400 500 600 700 800 900 1000
  e 137 237 337 437 537 637 737 837 937
  f 952 852 752 652 552 452 352 252 152 52
2 a 5 15 25 35 45 55 65 75 85 95
  b 1 11 21 31 41 51 61 71 81 91
  c 145 245 345 445 545 645 745 845 945
3 984 884 784 684 584 484 384 284 184 84

Activity 3

  1 E. McKenzie, 59 Great Western Road
  2 S. Davies, 94 Great Western Road
  3 A. Crosby, 122 Great Western Road
  4 M. Watson, 175 Great Western Road
  5 Car Kits, 225 Great Western Road
  6 Mo's Muncher, 309 Great Western Road
  7 Sports United, 326 Great Western Road
  8 Cut & Curl, 348 Great Western Road
  9 B. Bridges, 384 Great Western Road
10 Able Alarms, 467 Great Western Road
11 Akrams, 492 Great Western Road
12 D. Sangster, 851 Great Western Road

Activity 4

1 N. Garth, 47 High Street
2 International Inc, 123 High Street
3 McKie's, 181 High Street
4 L. Pegram, 265 High Street
5 Trelims Ltd., 224 High Street
6 ABC Writers, 196 High Street
7 S. Beck, 88 High Street
8 M. Heads, 52 High Street

Activity 5

1 a One hundred and fifty-six pounds 75 pence
  b Two hundred and thirty-six pounds only
  c Four hundred and sixty-five pounds 20 pence
  d £706.50
  e Five hundred and seventy-three pounds
    43 pence
  f £329.14
  g £614.61
  h £882.37
2 a Three hundred and six pounds 40 pence
  b One hundred and forty pounds 5 pence
3 a £502.10
  b £219.24

Activity 6

1 50 tins
2 30 tins
3 50 tins
4 40 tins
5 70 tins
6 80 tins
7 70 tins
8 90 tins
9 20 tins

Activity 7

Tile pattern	Number in stock	Number in stock rounding to nearest 100
Daisy	268	300
Shell	518	500
Fish	136	100
Star	375	400
Leaf	666	700
Swirl	372	400
Bubble	419	400
Ribbon	185	200
Corn	250	300

Activity 8

Poppy	146 + 72 = 218
Stripe	65 + 230 = 295
Floral	114 + 425 = 539
Scroll	218 + 124 = 342
Wave	142 + 375 = 517
Train	136 + 180 = 316
Swirl	19 + 380 = 399
United	245 + 245 = 490
Birds	153 + 77 = 230
Fern	307 + 108 = 415
Feather	256 + 248 = 504

Activity 9

1 437   **2** 999   **3** 898   **4** 629   **5** 908
6 810   **7** 578   **8** 611   **9** 922

Activity 10

Large mahogany	475 − 231 = 244
Medium mahogany	568 − 333 = 235
Small mahogany	356 − 215 = 141
Large beech	640 − 235 = 405
Medium beech	347 − 162 = 185
Small beech	241 − 175 = 66
Large ash	205 − 63 = 142
Medium ash	327 − 188 = 139
Small ash	402 − 276 = 126

Activity 11

Paintbrushes	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65
Tins of paint	8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96
Curtain poles	7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77
Fence posts	9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99
Nails	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000
Door knobs	50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550
Work gloves	20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220
Wallpaper	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275

Activity 12

Small red $36 \times 2 = 72$
Medium red $24 \times 3 = 72$
Large red $16 \times 5 = 80$
Small blue $36 \times 4 = 144$
Medium blue $24 \times 6 = 144$
Large blue $16 \times 7 = 112$
Small white $36 \times 8 = 288$
Medium white $24 \times 7 = 168$
Large white $16 \times 9 = 144$

Activity 13

Orchard	14 boxes of 8 rolls = 112 rolls
Fruit	35 boxes of 8 rolls = 280 rolls
Grapes	72 boxes of 6 rolls = 432 rolls
Circles	64 boxes of 6 rolls = 384 rolls
Spirals	58 boxes of 4 rolls = 232 rolls
Spots	29 boxes of 4 rolls = 116 rolls
Squares	53 boxes of 6 rolls = 318 rolls
Nursery	27 boxes of 8 rolls = 216 rolls

Activity 14

$28 \div 2 = 14$ boxes of 2 tiles
$23 \div 2 = 11$ r 1 = 11 boxes of 2 + 1 more tile
$18 \div 3 = 6$ boxes of 3 tiles
$25 \div 3 = 8$ r 1 = 8 boxes of 3 + 1 more tile
$36 \div 4 = 9$ boxes of tiles
$45 \div 4 = 11$ r 1 = 11 boxes of 4 tiles + 1 more tile
$64 \div 5 = 12$ r 4 = 12 boxes of 5 tiles + 4 more tiles
$70 \div 5 = 14$ boxes of tiles

Activity 15

1	Walsall	8 miles	4
2	Wolverhampton	14 miles	9
3	Coventry	18 miles	10
4	Bromsgrove	13 miles	8
5	Sutton Coldfield	6 miles	2
6	Smethwick	3 miles	1
7	Brownhills	12 miles	7
8	Aldridge	9 miles	5
9	Bilston	10 miles	6
10	Halesowen	7 miles	3

Activity 16

Halesowen $7 \times 65p = 455p = £4.55$
Smethwick $3 \times 65p = 195p = £1.95$
Sutton Coldfield $6 \times 65p = 390p = £3.90$

Activity 17

Your teacher will check your list of shapes.

Activity 18
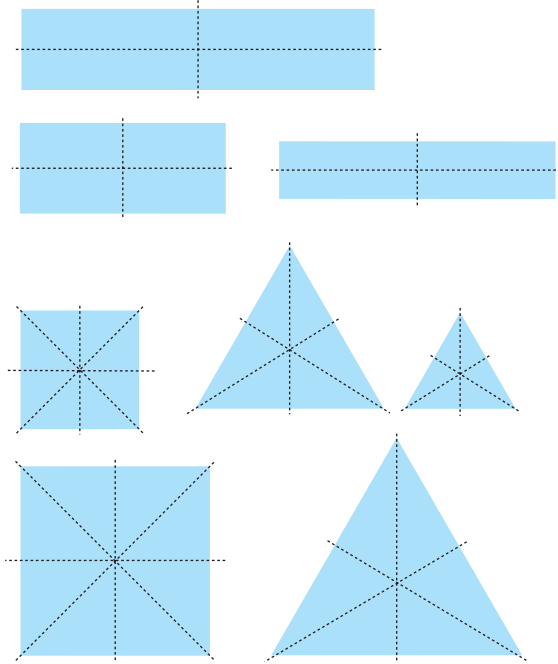
Activity 19

Tiles: 3
Lampshades: 2
Spray adhesive: 6

Show your drawings of the shapes on the shelf to your teacher.

Activity 20

Check your answers with your teacher.

Help

Activity H1

1 456   465   546   564   645   654
2 Show your answers to your teacher.

Activity H2

1 105   132   156   200   219   260   335   339
   401   468   587   637
2 999   982   873   810   704   681   644   555
   500   425   403   350

Activity H3

Even numbers: 76   248   842   980   404   676

Activity H4

143 ⟍ seven hundred and fifty-two
378 ⟋ one hundred and forty-three
906 ⟋⟍ four hundred and fifty
752 ⟋ three hundred and seventy-eight
450 ⟍ nine hundred and six

207 ⟍ six hundred and nineteen
330 ⟋ eight hundred and forty-eight
619 ⟋ two hundred and seven
848 ⟋ five hundred and eighty-seven
587 ⟍ three hundred and thirty

Activity H5

1
   a 47 miles is approximately 50 miles.
   b 22 miles is approximately 20 miles.
   c 58 miles is approximately 60 miles.
   d 63 miles is approximately 60 miles.
   e 76 miles is approximately 80 miles.
   f 81 miles is approximately 80 miles.

2
   a 368 km is approximately 400 km.
   b 839 km is approximately 800 km.
   c 520 km is approximately 500 km.
   d 421 km is approximately 400 km.
   e 666 km is approximately 700 km.
   f 228 km is approximately 200 km.

Activity H6

1 425 + 74 = 499 ✓
2 355 + 123 = 478 ✓
3 347 + 431 = 888 ✗(778)
4 352 + 174 = 426 ✗(526)
5 416 + 394 = 810 ✓
6 589 + 298 = 786 ✗ (887)
7 496 − 256 = 240 ✓
8 876 − 543 = 333 ✓
9 765 − 432 = 222 ✗ (333)
10 493 − 37 = 457 ✗(456)
11 648 − 592 = 46 ✗(56)
12 411 − 231 = 180 ✓

Activity H7

1 50   100   150   200   250   300   350   400
   450   500
2 100   200   300   400   500   600   700   800
   900   1000
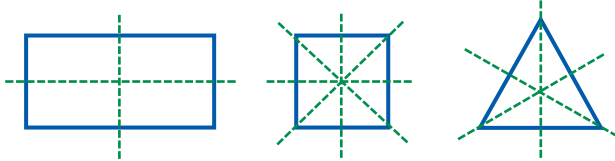**3** 25   50   75   100   125   150   175   200   225
   250

Activity H8

1 a $43 \times 2 = 86$ **b** $45 \times 5 = 225$ **c** $38 \times 3 = 114$
d $27 \times 4 = 108$
2 a $24 \div 2 = 12$ **b** $75 \div 5 = 15$ **c** $64 \div 4 = 16$
d $98 \div 3 = 32 \text{ r } 2$

Activity H9

Extension

Activity E1

222	220	225	227	202	252	272
257	275	205	250	207	270	

555	550	552	557	505	525	575
527	572	502	520	507	570	

777	770	772	775	707	727	757
725	752	702	720	705	750	

200	500	700	255	277	522	577
722	755					

There are 21 even numbers (underlined) and 27 odd numbers.

Activity E2

Activity E3

When you multiply a number by 10, all the digits move one place to the left.

Activity E4

When you multiply a number by 100, all the digits move two places to the left.

Activity E5

Show your shapes to your teacher.

Mini-projects

Show the results of your projects to your teacher.

Check it

Activity C1

65   99   125   189   211   273   378   400   425
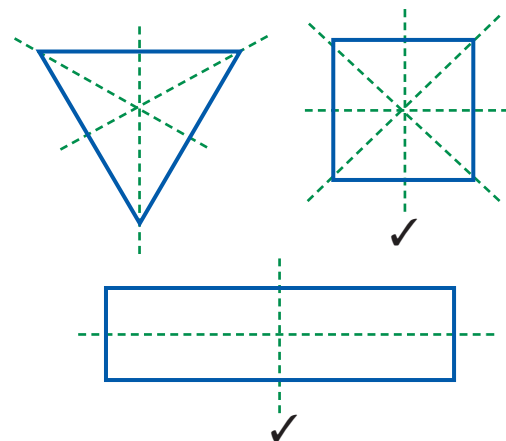763   1000

Activity C2

Odd numbers: 121   345   297   777   243   419

Activity C3

1 $145 + 260 = 405$ **3** $45 \times 4 = 180$
2 $320 - 146 = 174$ **4** $40 \div 5 = 8$

Activity C4

Activity C5

120 miles