E3 Numeracy

Unit 1

Number

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

....

Remember

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

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

384 184 684 984 584 284 784 484 884

....

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.

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, **641** is an odd number and **642** 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.

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 ☐

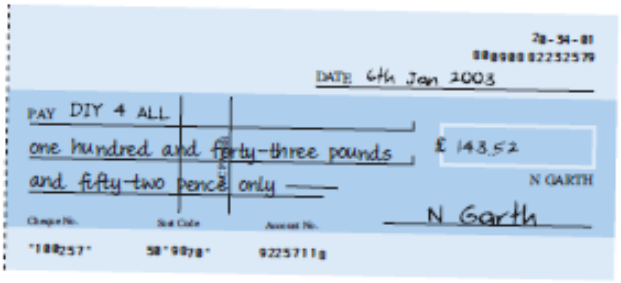
For more work on this, go to H1, H2 and H3 (page 20) or E1 (page 22).

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?

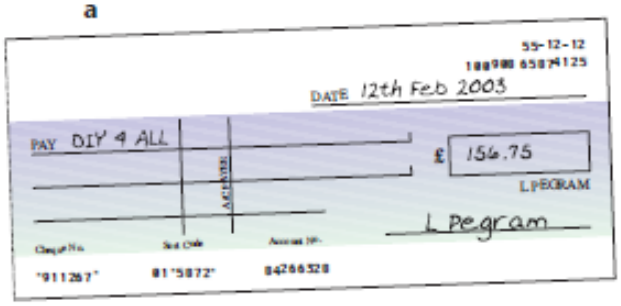
Look at the cheque below. In your group talk about how it has been completed.



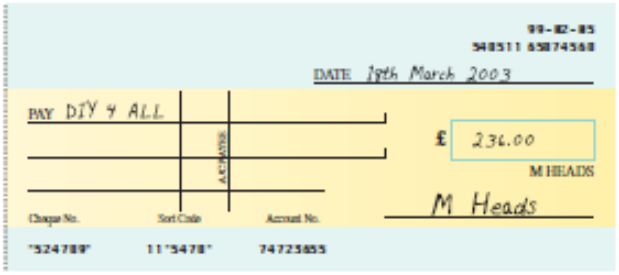
Activity 5

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

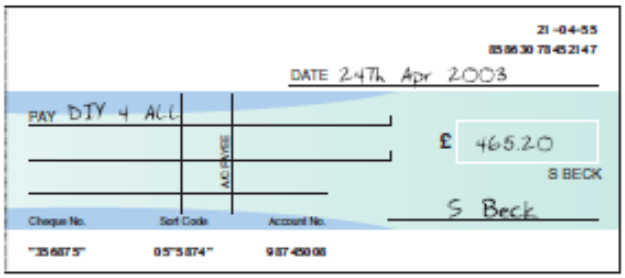
a



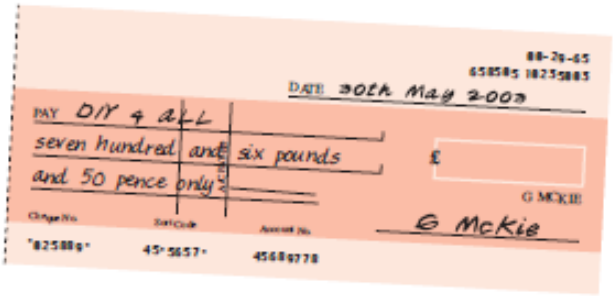
b



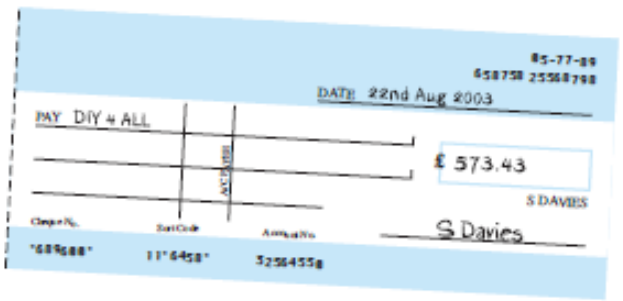
c



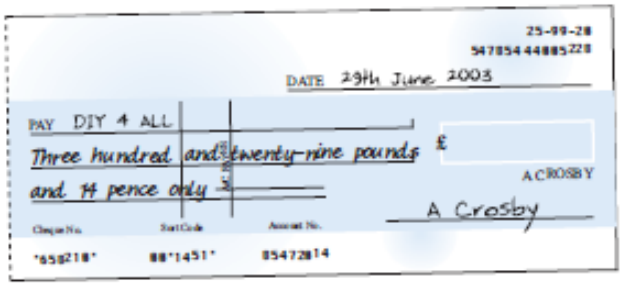
d



e



f



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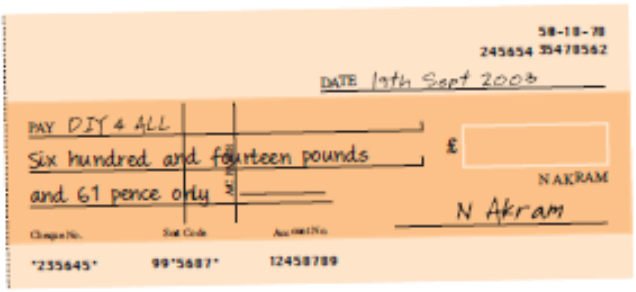
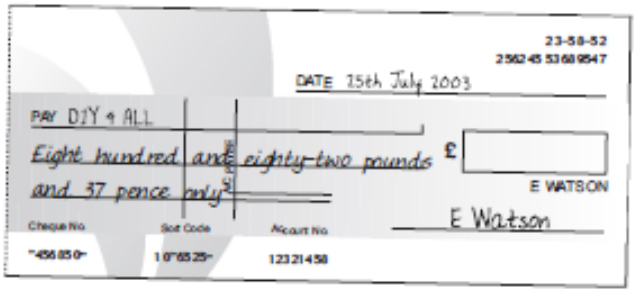
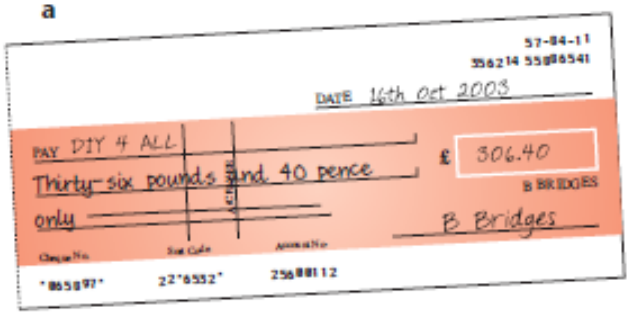


h

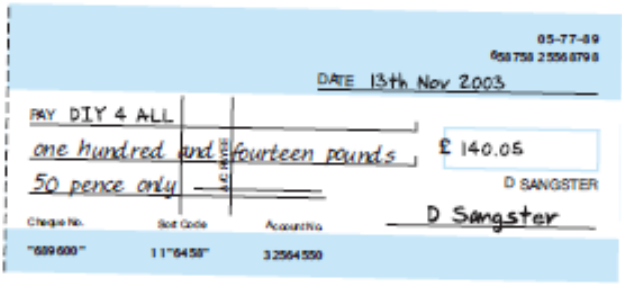


2 Look at these two cheques. The amount in words is incorrect. Write the correct amount in words underneath each.

a



b



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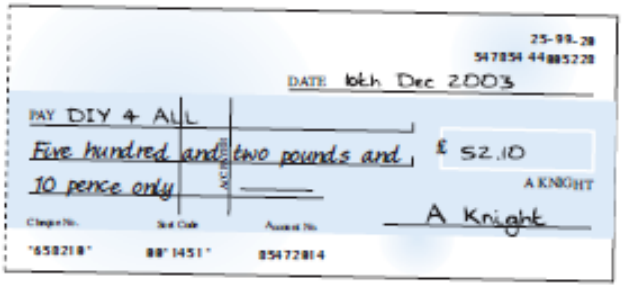
.....

.....

.....

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

a



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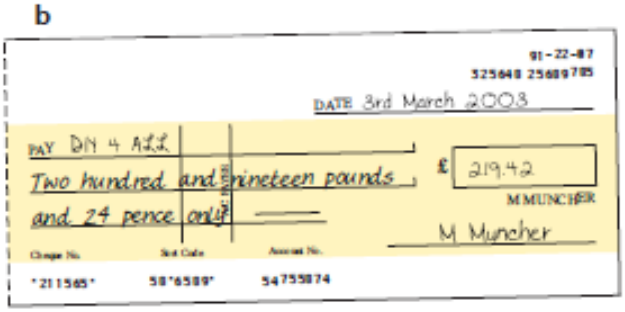

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.....

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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.

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.

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.

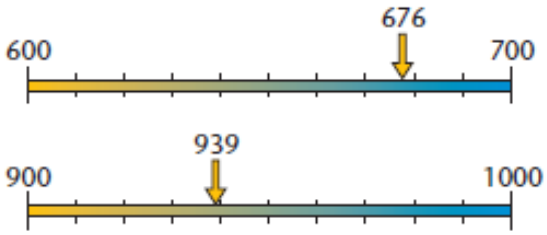
8 92 tins of white paint, rounded to the nearest 10 is ..... tins.

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

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.



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

	H	T	U
	200 +	40 +	0
add		70 +	5
	200 +	110 +	5 = 315

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

	H	T	U
	100 +	40 +	6
add		70 +	2

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.

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.				
	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 $36 \times 4 = 144$

	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

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.

DIY 4 ALL

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 ÷ 5.

20 ÷ 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**: $4 \times 5 = 20$

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.

If 26 tiles are needed and they come in boxes of 4, the calculation is

26 ÷ 4 = 6 remainder 2.

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

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:

2 6 ÷ 4 = answer 6.5 .

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

On the calculator type 6 × 4 = answer 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 ÷ 2 = 14

23 shell pattern tiles (boxes of 2) .....

18 corn pattern tiles (boxes of 3) .....

25 swirl pattern tiles (boxes of 3) .....

36 fish pattern tiles (boxes of 4) .....

45 star pattern tiles (boxes of 4) .....

64 swirl pattern tiles (boxes of 5) .....

70 wave pattern tiles (boxes of 5) .....

Review

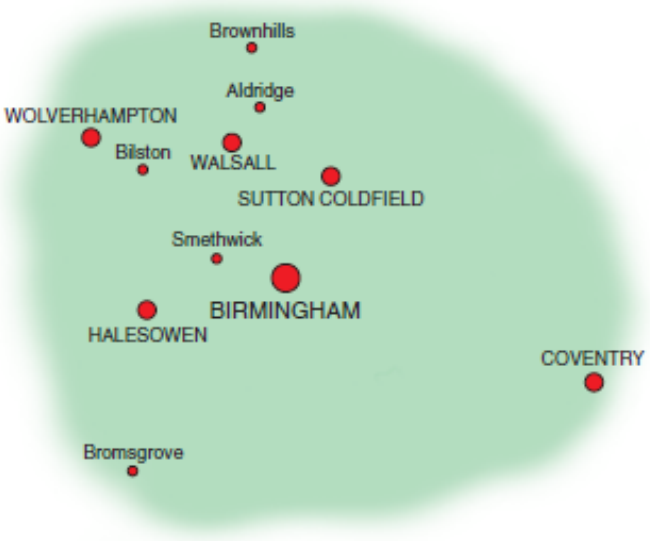
Do you need more practice in division? **Yes** ☐ **No** ☐

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

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 × 65p = 585p = £5.85

Calculate the delivery charges to:

1 Halesowen .....

2 Smethwick .....

3 Sutton Coldfield .....

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.

Activity 19

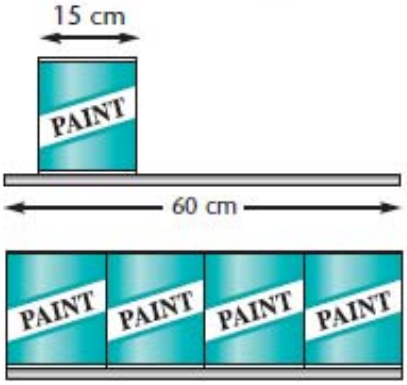
Think about the shelves at *DIY 4 All*. Each shelf in the display area of the shop is 60 cm wide.

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.)



1

2

3

....

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 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 H9

Draw all the lines of symmetry on these shapes.

Extension

Activity E1

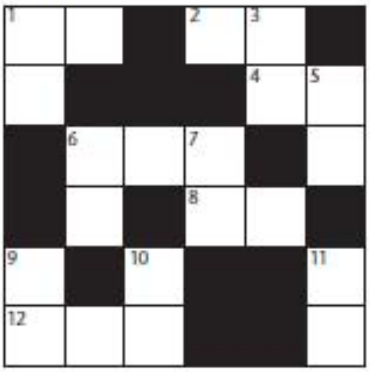
Work with another person. Use 0, 2, 5 and 7 to make as many different three-digit numbers as you can.

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

1 16×5
2 $69 \div 3$
4 31×3
6 51×5
8 10×5
12 107×3

Down

1 43×2
3 13×3
5 $68 \div 2$
6 $96 \div 4$
7 11×5
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.