Lesson 5 – Multiply Using the Area Model (Place Value Counters)

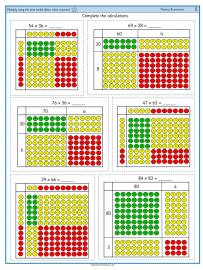
NC Objective:	Resources needed:	Vocabulary:
Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	Differentiated Sheets Teaching Slides	Multiplication, partition, represent, area model

Children use place value counters to represent the area model of multiplication.

Key Questions:

What are we multiplying?
How can we partition these numbers?
Where can see 20 x 20?
What does the 40 represent?
What's the same and what's the different between the three representations (Base 10, place value counters, grid)?

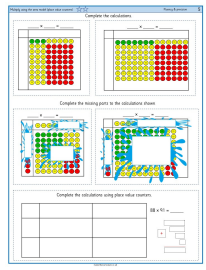
★ Working Towards



On this sheet, children use place value grids to find the result of multiplication. The calculation are written for them.

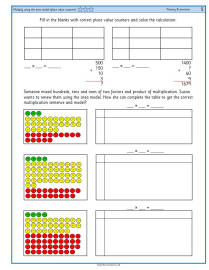
They are to show their answer in table form (see answers) in their books next to the pictorial image.

★★ Working Within



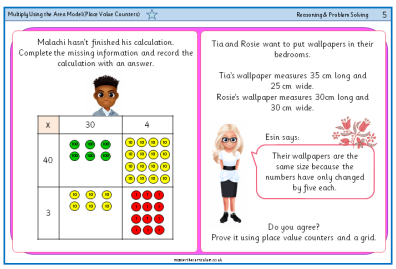
On this sheet, children have to represent their calculations and also complete place value grids to represent a calculation.

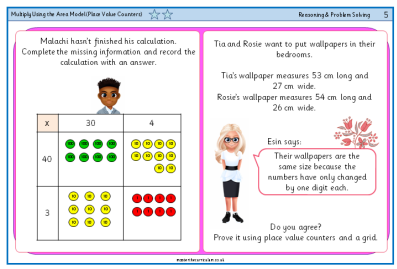
★★★ Greater Depth

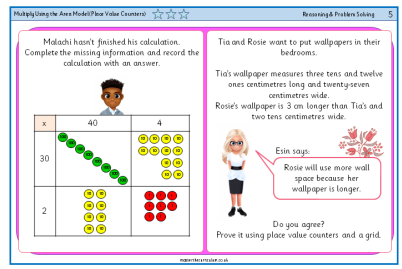


On this sheet, children use reasoning skills to complete their calculations using the information provided to them. They show calculations using a place value chart that they have constructed.

Reasoning & Problem Solving

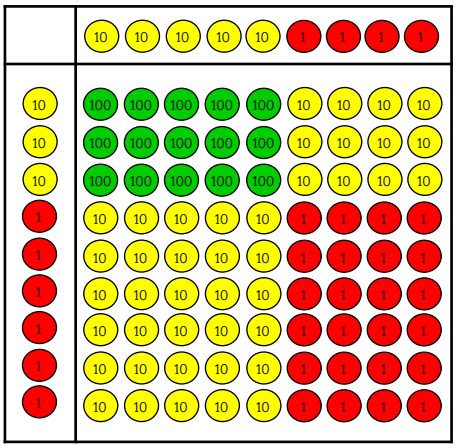




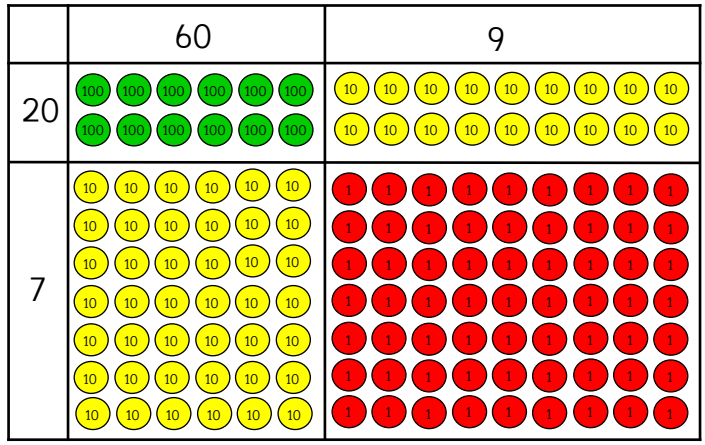


Complete the calculations.

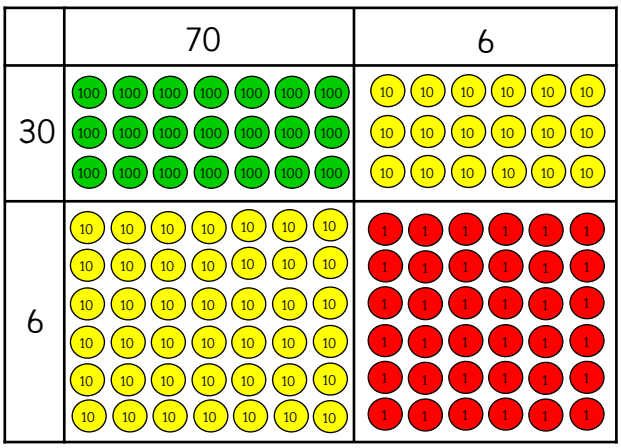
54 × 36 = _____



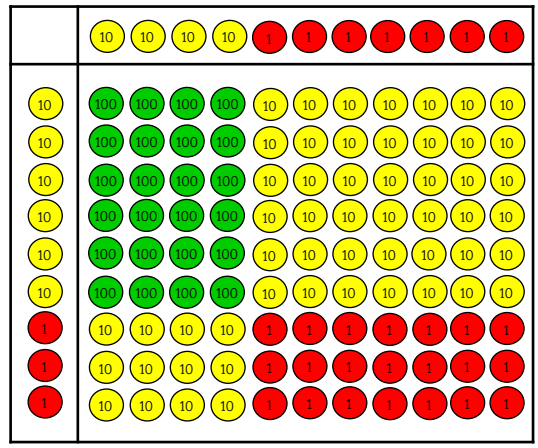
69 × 27 = _____



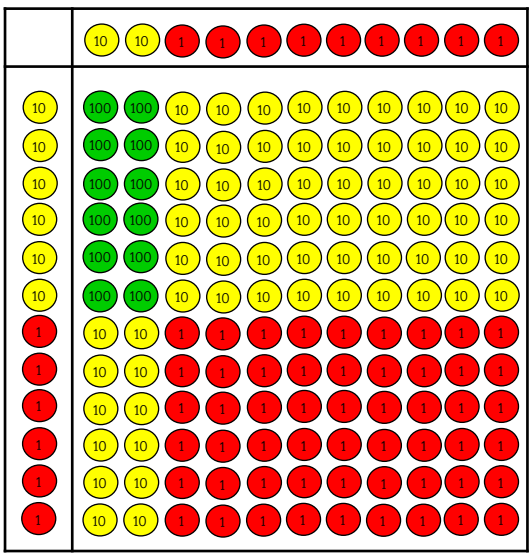
76 × 36 = _____



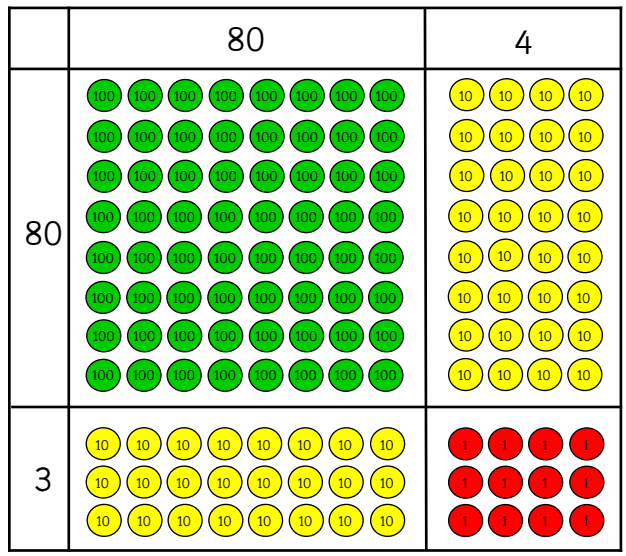
47 × 63 = _____



29 × 66 = _____



84 × 83 = _____



Complete the calculations.

54 × 36 = 1944

	50	4
30	1500	120
6	300	24

1500
+ 300
120
24
1944

69 × 27 = 1863

	60	9
20	1200	180
7	420	63

1200
+ 420
180
63
1863

76 × 36 = 2736

	70	6
30	2100	180
6	420	36

2100
+ 420
180
36
2736

47 × 63 = 2961

	40	7
60	2400	420
3	120	21

2400
+ 420
120
21
2961

29 × 66 = 1914

	20	9
60	1200	540
6	120	54

1200
+ 540
120
54
1914

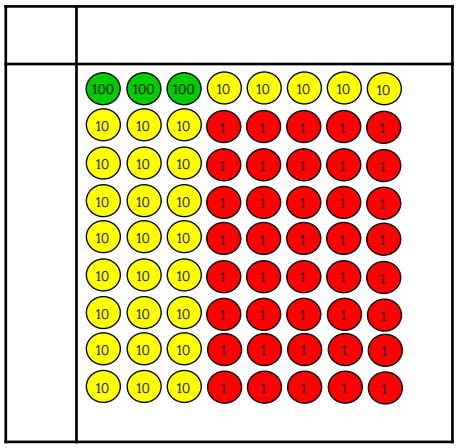
84 × 83 = 6972

	80	4
80	6400	320
3	240	12

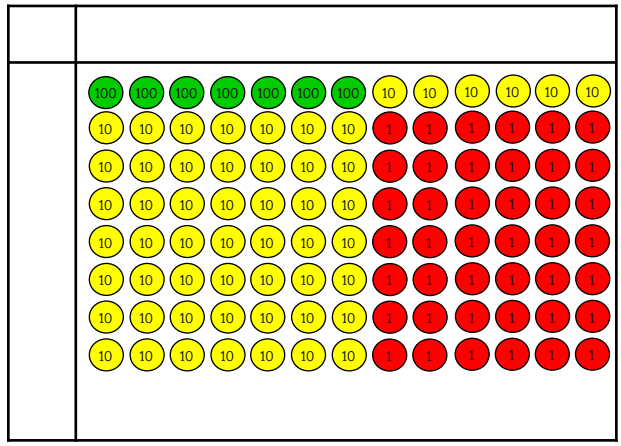
6400
+ 320
240
12
6972

Complete the calculations.

_____ × _____ = _____

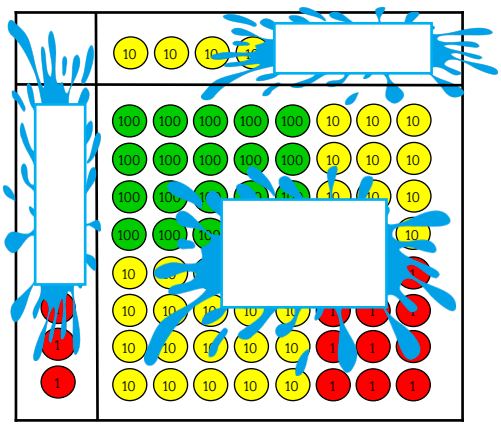


_____ × _____ = _____

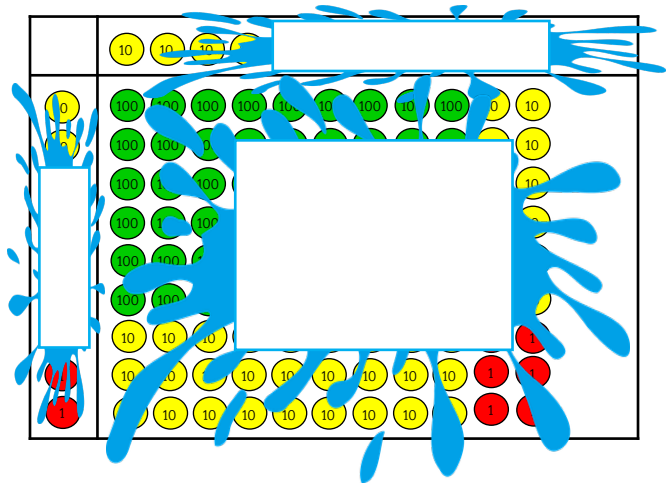


Complete the missing parts to the calculations shown.

_____ × _____ = _____

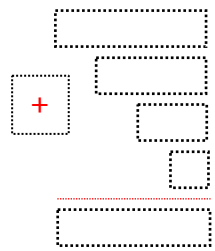


_____ × _____ = _____



Complete the calculations using place value counters.

88 × 91 = _____



Complete the calculations.

35 × 18 = 630

	30	5
10	300	50
8	240	40

300
+ 240
50
40
630

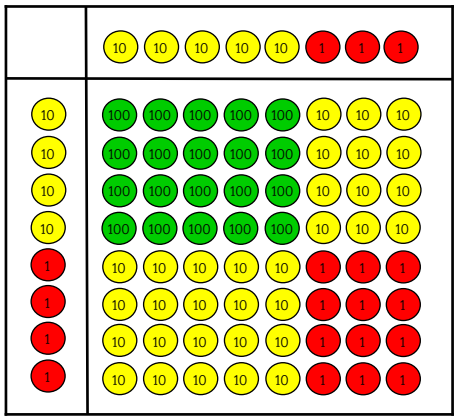
76 × 17 = 1292

	70	6
10	700	60
7	490	42

700
+ 490
60
42
1292

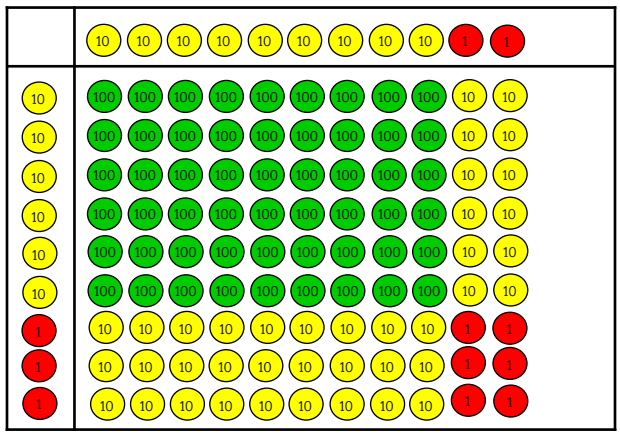
Complete the missing parts to the calculations shown.

53 × 44 = 2332



2000
+ 200
120
12
2332

92 × 63 = 5796



5400
+ 270
120
6
5796

Complete the calculations using place values.

88 × 91 = 8008

	80	8
90	7200	720
1	80	8

7200
+ 720
80
8
8008

Fill in the blanks with correct place value counters and solve the calculation.

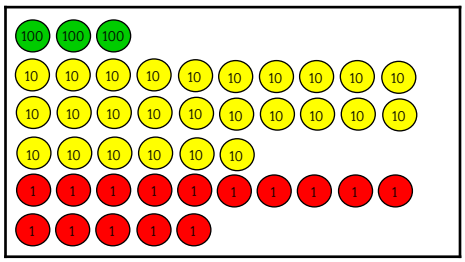
____ × ____ = _____

500
+ 150
10
3
?

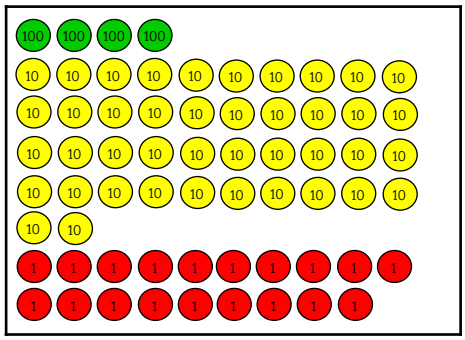
____ × ____ = _____

1400
+ ?
60
9
1679

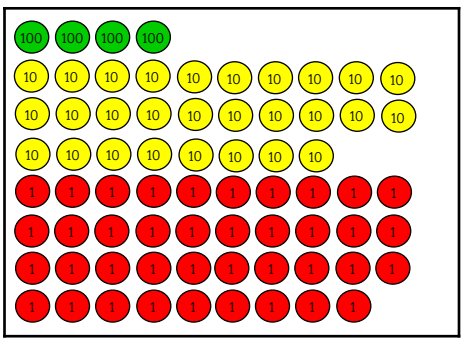
Someone mixed hundreds, tens and ones of two factors and product of multiplication. Susan wants to renew them using the area model. How she can complete the table to get the correct multiplication sentence and model?



____ × ____ = _____



____ × ____ = _____



____ × ____ = _____

Fill in the blanks with correct place value counters and solve the calculation.

	50	1
10	500	10
3	150	3

51 × 13 = 663

500
+ 150
10
3
663

	70	3
20	1400	60
3	210	9

73 × 23 = 1679

1400
+ 210
60
9
1679

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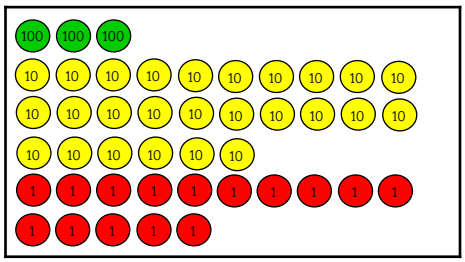
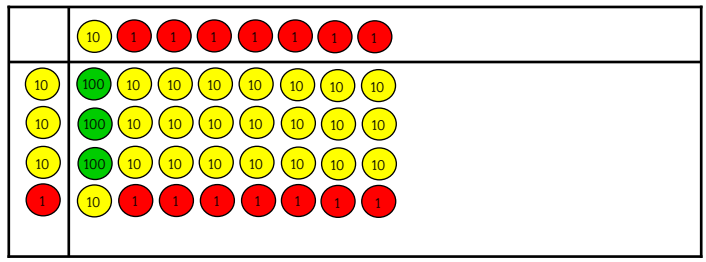
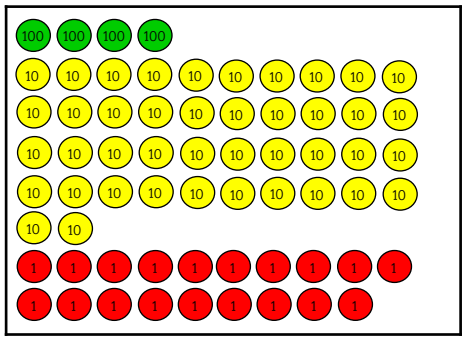
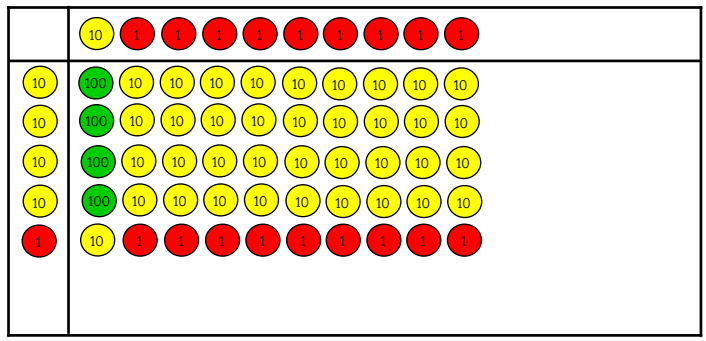


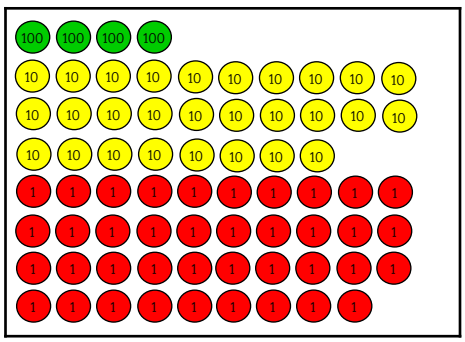
Answer: 17 × 31 = 527



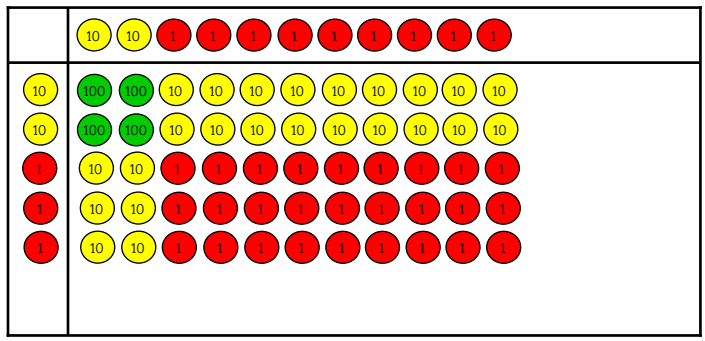


Answer: 19 × 41 = 779

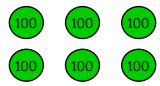
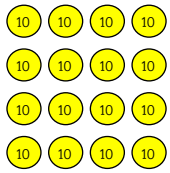
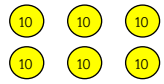
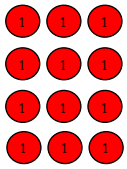




Answer: 29 × 23 = 667



Malachi hasn't finished his calculation.
Complete the missing information and record the calculation with an answer.

x	30	4
40		
3		

Tia and Rosie want to put wallpapers in their bedrooms.

Tia's wallpaper measures
35 cm long and 25 cm wide.

Rosie's wallpaper measures
30cm long and 30 cm wide.

Esin says:

Their wallpapers are the same size because the numbers have only changed by five each.

Do you agree?
Prove it using place value counters and a grid.

Multiply Using the Area Model (Place Value Counters) ☆ Reasoning & Problem Solving 5

Malachi hasn't finished his calculation.
Complete the missing information and record the calculation with an answer.

x	30	4
40		
3		

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x	30	4
40	100 100 100 100 100 100	10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
3	10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

Malachi needs 6 more hundreds, 30 × 40 = 1,200 and he only has 600. Also, he needs 3 more tens, 30 x 4 = 90, and he has 60.
His calculation is 34 × 43 = 1,462

Tia and Rosie want to put wallpapers in their bedrooms.

Tia's wallpaper measures 35 cm long and 25 cm wide.

Rosie's wallpaper measures 30cm long and 30 cm wide.

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Their wallpapers are the same size because the numbers have only changed by five each.

Using place value counters and a grid, children will prove that Esin is wrong.
35 x 25 = 875,
30 x 30 = 900
Do you agree?
Prove it using place value counters and a grid.

Multiply Using the Area Model (Place Value Counters) ☆ Answers Reasoning & Problem Solving 5

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Tia and Rosie want to put wallpapers in their bedrooms.

Tia's wallpaper measures
53 cm long and 27 cm wide.

Rosie's wallpaper measures
54 cm long and 26 cm wide.

Esin says:

Their wallpapers are the same size because the numbers have only changed by one digit each.

Do you agree?
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Multiply Using the Area Model (Place Value Counters) ☆☆ Reasoning & Problem Solving 5

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x	30	4
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3	10 10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1

Malachi needs 4 more hundreds, 30 × 40 = 1,200 (he has 800). Also, he needs 6 more tens, 4 x 40 = 160, (he has 100) and 4 more ones, 4 x 3 = 12 (he has 8).
His calculation is 34 × 43 = 1,462

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Using place value counters and a grid, children will prove that Esin is wrong.
53 x 27 = 1,431,
54 x 26 = 1,404.
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x	40	4
30	100 100 100 100 100 100 100	10 10 10 10 10 10 10 10 10 10
2	10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1

Tia and Rosie want to put wallpapers in their bedrooms.

Tia's wallpaper measures three tens and twelve ones centimetres long and twenty-seven centimetres wide.

Rosie's wallpaper is 3 cm longer than Tia's and two tens centimetres wide.

Esin says:

Rosie will use more wall space because her wallpaper is longer.

Do you agree?
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His calculation is 44 × 32 = 1,408.

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Esin says:

Rosie will use more wall space because her wallpaper is longer.

Using place value counters and a grid, children will prove that Esin is wrong.
Tia: 42 x 27 = 1,134cm
Rosie: 45 x 20 = 900 cm
Do you agree?
Prove it using place value counters and a grid.

Multiply Using the Area Model (Place Value Counters) ☆☆☆ Answers Reasoning & Problem Solving 5

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x	40	4
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