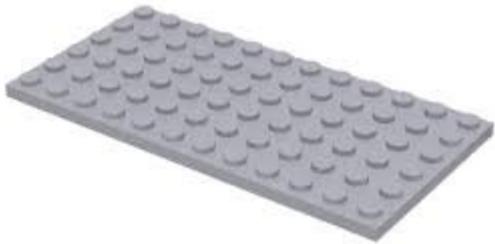


At-Home Investigation

Sometimes arrays are quite large and need to be broken into smaller amounts to make the multiplication easier.

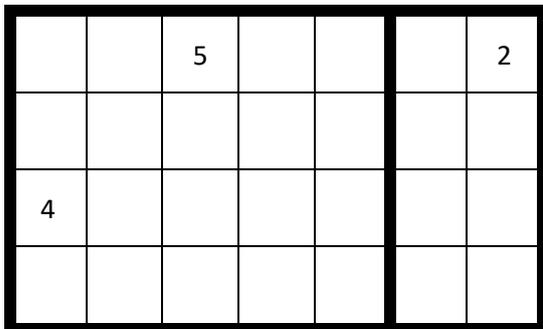
Examine a large Lego piece

The Lego piece below has lots of dots on it. It is 6 dots wide and 12 dots long. Draw a rectangle on your grid paper to represent the Lego piece. How long is it? How wide is it?



Think it through

Multiplying 6×12 is tricky. Perhaps there is a way that we can break up the 12 or the 6 to make it easier? Write down at least 2 ideas about how you could break your rectangle up to make it easier to work out the total number of squares. Here is an example of how we could break up 4×7 into a 4×5 part and a 4×2 part.

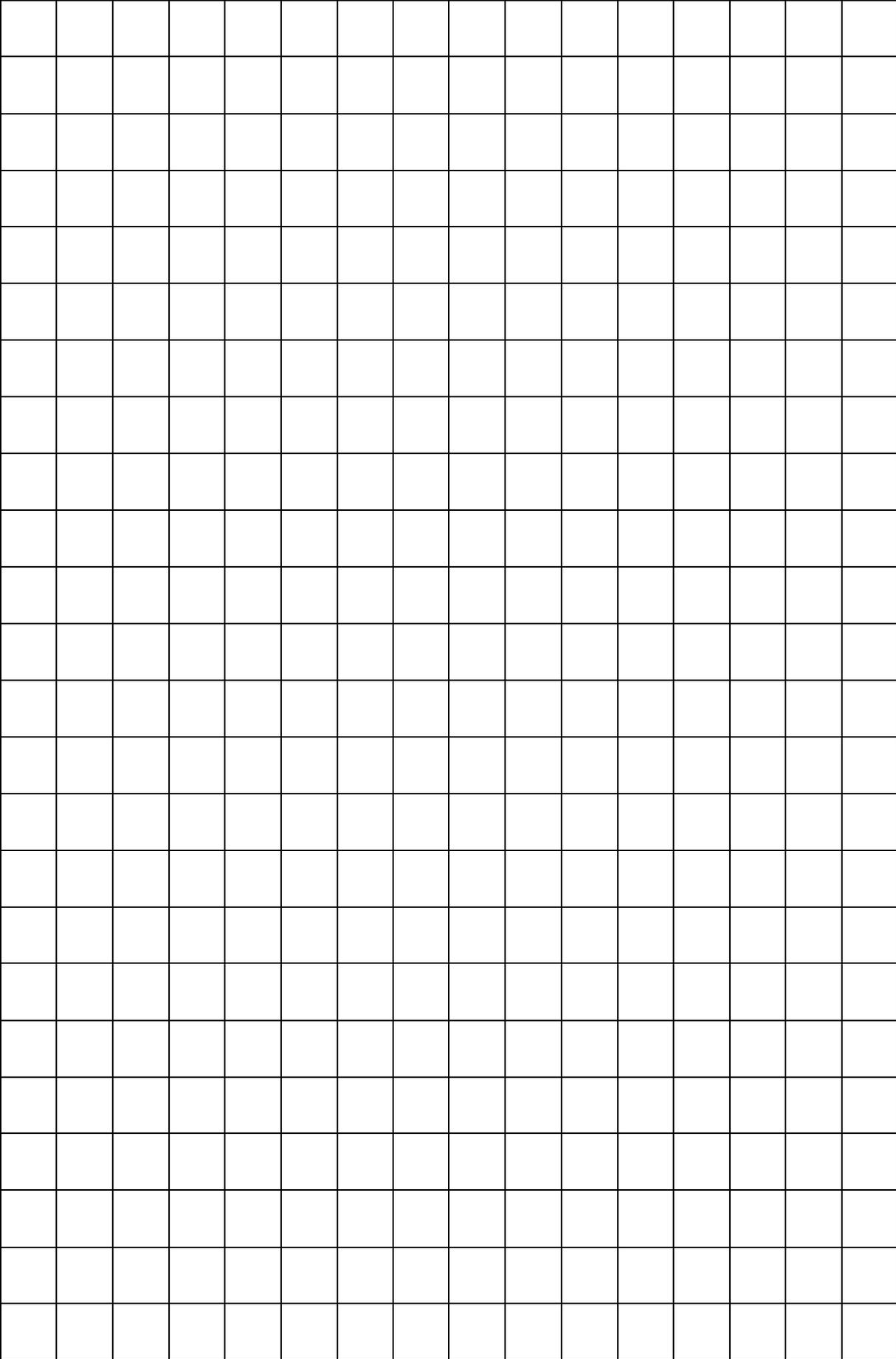


Try out at least 2 of your ideas on your grid paper. Sketch what you did here and write on the numbers. What did you find that worked?

Generalise your findings:

Do you think you could come up with a similar idea for other tricky numbers too? What might you do if one side of the rectangle was 4 and the other side was:

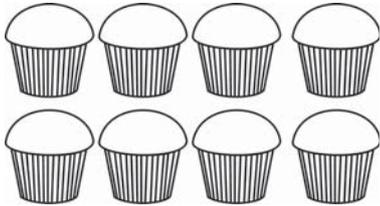
- 6
- 7
- 9
- 8



D16. Arrays and skip counting

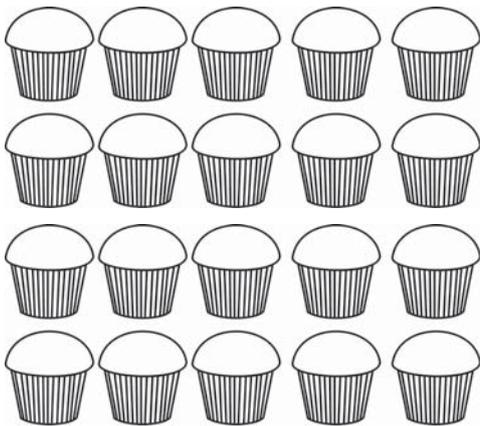
The following pictures show arrays. Your job is to work out how to count arrays without having to count every single object.

1. One way that I could count the following muffins is like this: 2, 4, 6, 8.



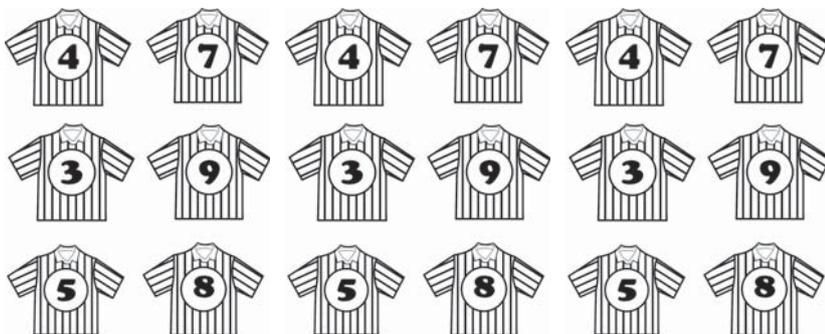
2. What is another way that I could count them?

3. How could I count the muffins below?



4. How else could I count these muffins?

5. How could I count these jerseys?



6. How else could I count these jerseys?

7. Soldiers were lined up in rows of five. There were four rows of five.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- Colour in red one of the sets of counting numbers that would help you work out how many soldiers there were. Write them here:
- Colour in blue the other set of that would help you work out how many soldiers there were. Write them here:

Which number is coloured in red and blue? Explain why it is coloured in both colours:

8. Muffins were lined up in rows of four. There were six rows of four.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- Colour in red one of the sets of counting numbers that would help you work out how many muffins there were. Write them here:
- Colour in blue the other set of that would help you work out how many muffins there were. Write them here:

Which number is coloured in red and blue? Explain why it is coloured in both colours:

BACKWARDS QUESTION:

What is missing from this counting pattern? _____, _____, 6, _____, 12, _____

How did you know?

Connecting adding and multiplying

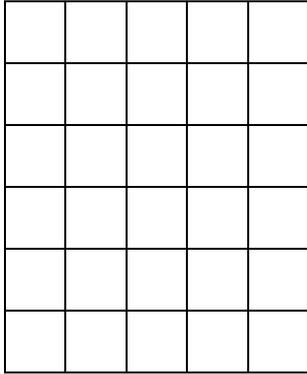
Both adding and multiplying number sentences can be used to describe arrays. Your job is to use the questions below to work out how they are connected.

Matthew collects stickers. He puts them in rows of five on his sticker chart. He makes six rows of stickers. How many does he have? Draw his sticker collection below:

1. How could you count the stickers in collections? Write the counting numbers that you could use at the end of each row and column.
2. Using the counting numbers, write two different Addition number sentences that you could use to work out how many stickers there are altogether. Use this space:

3. Now write two different Multiplication number sentences that you could use to work out how many stickers there are altogether. Check them with your calculator. Use this space:

The number sentences that you wrote are connected. Use the questions below to work out how they are connected.



Add sentence: $5 + 5 + 5 + 5 + 5 + 5 =$

Multiply sentence: $5 \times 6 =$

Write any others that are related here:

1. Look at the Multiplication sentence.
 - What does the five mean?
 - Where is the five in the drawing?
 - Where is the five in the Addition sentence?

2. Look at the Multiplication sentence.
 - What does the six mean?
 - Where is the six in the drawing?
 - Where is the six in the Addition sentence?

3. If Matthew had seven rows instead of six, how would your number sentences change?
Write new number sentences below and adjust your picture above.

Interleaved practice

Number:

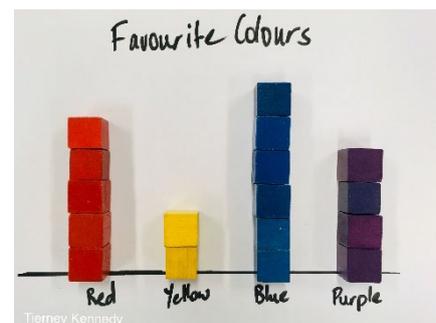
- Starting at 4 257, count in 100s until you get to 5 257.
- $342 - \underline{\quad} = 127$
- What number is 1 more than 5 099? Now write the number that is 10 more and the number that is 100 more than 5 099.
- Read this number and say it: 1 708. Write it in words. How many thousands, hundreds, tens and ones does it have?
- Share 30 counters to show halves. Then show thirds and fifths.

Measurement/Geometry:

- Find and draw a container that has a 1 litre capacity. Write down the name of one container that holds less than a litre and one that holds more than a litre.
- How long is it until lunch time?
- Draw a simple map to show how to get from your bedroom to the kitchen. Include how many steps are needed and the turns you need to make.

Chance/Data:

- What can you tell from the information in the graph?
Write 3 **true** statements.
What is one thing that the graph **does not** tell you?



D20. Work out \times facts

You need to be able to work out how to multiply numbers and remember the answers quickly. In this activity you will work out each of the multiplication questions and fill the results into the table.

Strategies to use:

1. Skip counting (3, 6, 9)
2. Doubles (2, 4, 6, 8)
3. Counting on from what you know (I know 3×2 is 6, so 3×3 must be 3 more than 6)
4. Turn arounds (I know 4×5 is 20, so 5×4 is 20 too)

Choose a blank square. Line up the row it is in with the column it is in. There will be a number at the start of the row and at the start of the column. Multiply the two numbers and put the answer in that square. (Eg. see below: $4 \times 5 = 20$)

x	1	2	3	4	5	6	7	8	9	10
1			3							
2			6							
3			9							
4					20					
5				20						
6										
7										
8										
9										
10										

BACKWARDS QUESTION:

If my answer was 12, what numbers could I have multiplied to get it? Give as many answers as you can.