Here is one batch of muffins.

Teddy bakes 11 batches of muffins.
How many muffins does he have altogether?

In each batch there are 3 strawberry, 3 vanilla, 4 chocolate and 2 toffee muffins.
How many of each type of muffin does Teddy have in 11 batches?

Teddy sells 5 batches of muffins.
How many muffins does he have left?

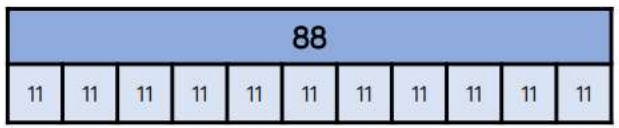
Teddy has 132 muffins altogether.

Strawberry: 33
Vanilla: 33
Chocolate: 44
Toffee: 22

$132 - 55 = 77$

Teddy has 77 muffins left.

Rosie uses a bar model to represent 88 divided by 11



Explain Rosie's mistake.

Can you draw a bar model to represent 88 divided by 11 correctly?

Rosie has divided by grouping in 11s but has found 11 groups of 11 which is equal to 121

To divide 88 by sharing into 11 equal groups, there would be 8 in each group.

To divide 88 by grouping in 11s, there would be 8 groups of 11

Choose three digit cards.
Arrange them in the calculation.

□ × □ × □ = □

How many different calculations can you make using your three digit cards?
Which order do you find it the most efficient to calculate the product?
How have you grouped the numbers?

Possible answers using 3, 4 and 7:

$7 \times 3 \times 4 = 84$
$7 \times 4 \times 3 = 84$
$4 \times 3 \times 7 = 84$
$4 \times 7 \times 3 = 84$
$3 \times 4 \times 7 = 84$
$3 \times 7 \times 4 = 84$

Children may find it easier to calculate 7×3 first and then multiply it by 4 as 21 multiplied by 4 has no exchanges.

Make the target number of 84 using three of the digits below.

7	5	3	4	6	2

□ × □ × □ = 84

Multiply the remaining three digits together, what is the product of the three numbers?

Is the product smaller or larger than 84?

Can you complete this problem in more than one way?

Possible answers:

$7 \times 2 \times 6 = 84$

$4 \times 3 \times 5 = 60$

60 is smaller than 84

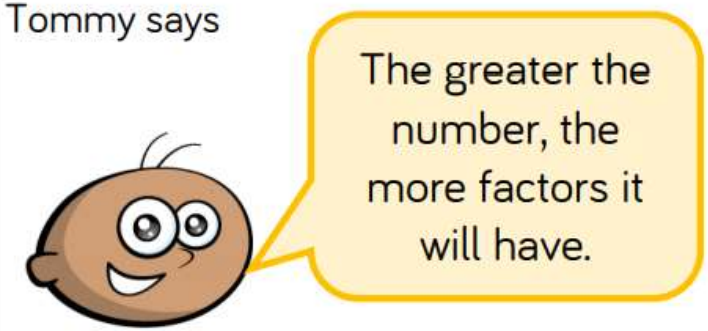
$7 \times 3 \times 4 = 84$

$2 \times 6 \times 5 = 60$

60 is smaller than 84

Children may also show the numbers in a different order.

Tommy says



Is Tommy correct?

Use arrays to explain your answer.

Tommy is incorrect.
Children explain by showing an example of two numbers where the greater number has less factors.
For example, 15 has 4 factors 1, 3, 5 and 15
17 has 2 factors 1 and 17

Some numbers are equal to the sum of all their factors (not including the number itself).
e.g. 6
6 has 4 factors, 1, 2, 3 and 6
Add up all the factors not including 6 itself.
$1 + 2 + 3 = 6$
6 is equal to the sum of its factors (not including the number itself)

How many other numbers can you find that are equal to the sum of their factors?
Which numbers are less than the sum of their factors?
Which numbers are greater than the sum of their factors?

Possible answers

$28 = 1 + 2 + 4 + 7 + 14$

28 is equal to the sum of its factors.

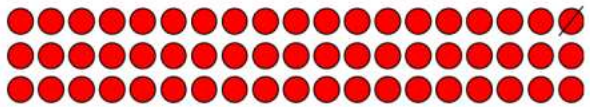
$12 < 1 + 2 + 3 + 4 + 6$

12 is less than the sum of its factors.

$8 > 1 + 2 + 4$

8 is greater than the sum of its factors.

Teddy has calculated 19 × 3



20 × 3 = 60
60 – 1 = 59
19 × 3 = 59

Can you explain his mistake and correct the diagram?

Teddy has subtracted one, rather than one group of 3

He should have calculated,

20 × 3 = 60

60 – 1 × 3 = 57

Here are three number cards.

21 42 38

Dora, Annie and Eva choose one of the number cards each.
They multiply their number by 5

Dora says,

I did 40 × 5 and then subtracted 2 lots of five.

Annie says,

I multiplied my number by 10 and then divided 210 by 2

Eva says,

I halved my 2-digit number and doubled 5 so I calculated 21 × 10

Which number card did each child have?
Would you have used a different method to multiply the numbers by 5?

Dora has 38

Annie has 21

Eva has 42

Children can then discuss the methods they would have used and why.

Here are 6 multiplications.

43 × 5	54 × 6	38 × 6
33 × 2	19 × 7	84 × 5

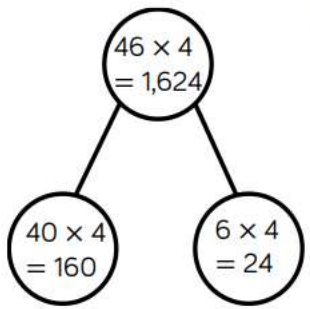
Which of the multiplications would you calculate mentally?
Which of the multiplications would you use a written method for?

Explain your choices to a partner.
Did your partner choose the same methods as you?

Children will sort the multiplications in different ways.

It is important that teachers discuss with the children why they have made the choices and refer back to the efficient multiplication step to remind children of efficient ways to multiply mentally.

Ron is calculating 46 multiplied by 4 using the part-whole model.



Can you explain Ron's mistake?

Ron has multiplied the parts correctly, but added them up incorrectly.
160 + 24 = 184

Alex completes the calculation:

$$43 \times 2$$

Can you spot her mistake?

	T	O
	4	3
×		2
		6
+		8
	1	4

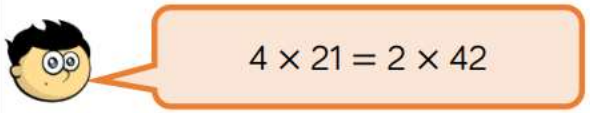
Alex has multiplied 4 by 2 rather than 40 by 2

Teddy completes the same calculation as Alex.
Can you spot and explain his mistake?

	T	O
	4	3
×		2
8	0	6

Teddy has written 80 where he should have just put an 8 because he is multiplying 4 tens by 2 which is 8 tens. The answer should be 86

Dexter says,



Is Dexter correct?

True. Both multiplications are equal to 84

Children may explore that one number has halved and the other has doubled.

Here are three incorrect multiplications.

	T	O
	6	1
×		5
	3	5

	T	O
	7	4
×		7
4	9	8

	T	O
	2	6
×		4
8	2	4

Correct the multiplications.

	T	O
	6	1
×		5
3	0	5

3

	T	O
	7	4
×		7
5	1	8

2

	T	O
	2	6
×		4
1	0	4

2

Always, sometimes, never

- When multiplying a two-digit number by a one-digit number, the product has 3 digits.
- When multiplying a two-digit number by 8 the product is odd.
- When multiplying a two-digit number by 7 you need to exchange.

Prove it.

Sometimes: 12 × 2 has only two-digits; 23 × 5 has three digits.

Never: all multiples of 8 are even.

Sometimes: most two-digit numbers need exchanging, but not 10 or 11