Lesson 17 – Multiplication & Division – Multiply by 8

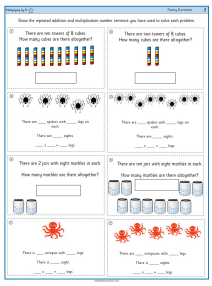
NC Objective:	Resources needed:	Vocabulary:
Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know	Differentiated Sheets Teaching Slides Concrete resources to use for multiplying if needed	Multiplication, multiplier, multiplicand, 'multiple of', addition, repeated addition, equal

Building on their knowledge of the 4 times table, children start to multiply by 8, understanding that each multiple of 8 is double its equivalent multiple of 4.
They link multiplying by eight to previous knowledge of equal groups and repeated addition. Children explore t he concept of multiplying by 8 in different ways, when 8 is the multiplier (first number in the multiplication calculation) and where 8 is the multiplicand (second number).

Key Questions:

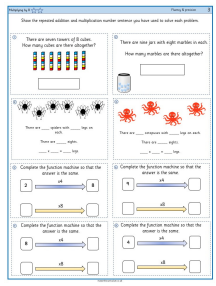
How many equal groups do we have? How many are in each group? How many do we have altogether?
Can you write a number sentence to show this? Can you represent the problem in a picture?
Can you use concrete apparatus to solve the problem? How many lots of 8 do we have?
How many groups of 8 do we have? We have 8 groups, so how many are in each group?

★ Working Towards



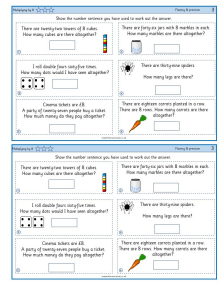
Children on this sheet focus on multiplying 8 by 2, 4, 5 and 10. They write the repeated addition number sentence and they also write the multiplication number sentence next to the word problem in their book. They can show their solution using equipment, arrays or bar models.

★★ Working Within



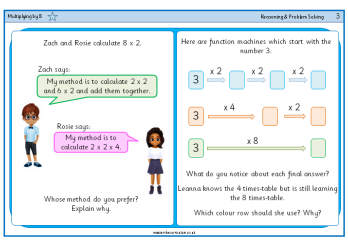
Children on this sheet write their own repeated addition number sentence to match each pictorial representation/word problem and they also write the multiplication calculation used. They can show their solution using arrays or bar models.

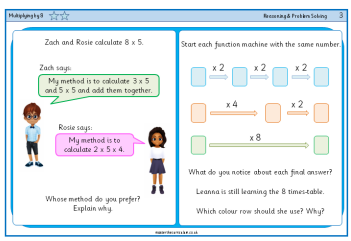
★★★ Greater Depth

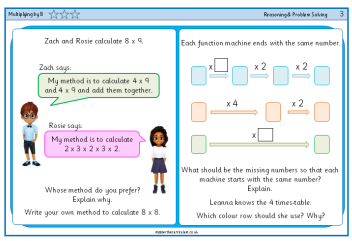


On this sheet, children are fluent in multiplying by 8. They use known facts to solve the multiplication questions, e.g. 75 x 8. They are to calculate 70 x 8, then 5 x 8 and add together to find the answer.

Reasoning & Problem Solving



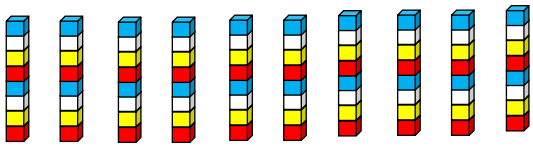




Show the repeated addition and multiplication number sentence you have used to solve each problem.

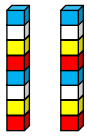
1

There are ten towers of 8 cubes.
How many cubes are there altogether?

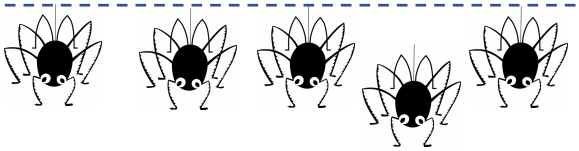


2

There are two towers of 8 cubes.
How many cubes are there altogether?



3

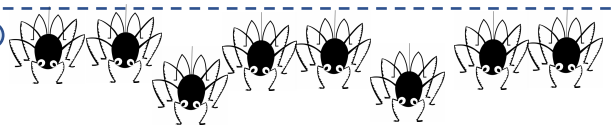


There are _____ spiders with _____ legs on each.

There are _____ eights.

_____ x _____ = _____ legs.

4



There are _____ spiders with _____ legs on each.

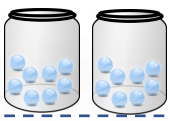
There are _____ eights.

_____ x _____ = _____ legs.

5

There are 2 jars with eight marbles in each.

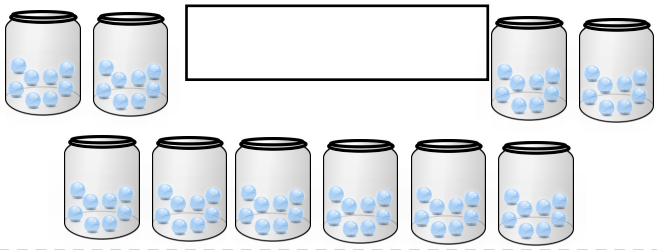
How many marbles are there altogether?



6

There are ten jars with eight marbles in each.

How many marbles are there altogether?



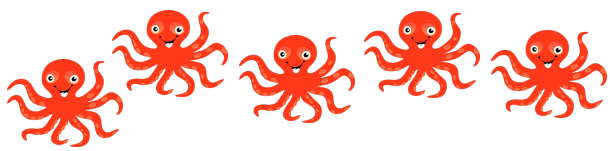
7

There is _____ octopus with _____ legs.

There is _____ eight.

_____ x _____ = _____ legs.

8



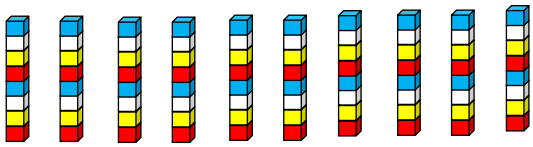
There are _____ octopuses with _____ legs.

There are _____ eights.

_____ x _____ = _____ legs.

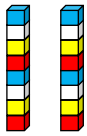
Show the repeated addition and multiplication number sentence you have used to solve each problem.

① There are ten towers of 8 cubes.
How many cubes are there altogether?



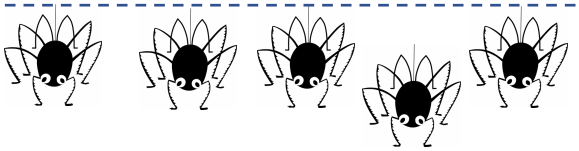
10 x 8 = 80

② There are two towers of 8 cubes.
How many cubes are there altogether?



2 x 8 = 16

③

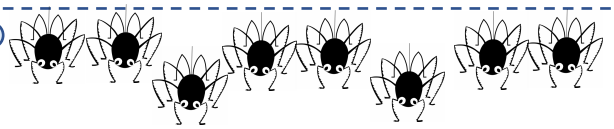


There are 5 spiders with 8 legs on each.

There are 5 eights.

5 x 8 = 40 legs.

④



There are 8 spiders with 8 legs on each.

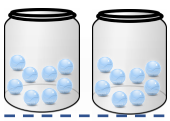
There are 8 eights.

8 x 8 = 64 legs.

⑤ There are 2 jars with eight marbles in each.

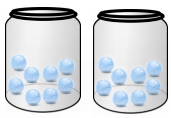
How many marbles are there altogether?

2 x 8 = 16

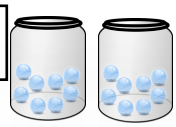


⑥ There are ten jars with eight marbles in each.

How many marbles are there altogether?



10 x 8 = 80



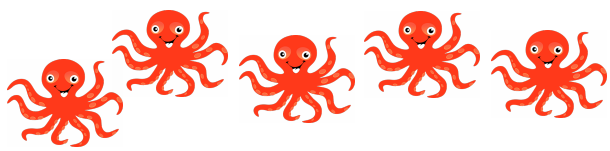
⑦

There is 1 octopus with 8 legs.

There is 1 eight.

8 x 1 = 8 legs.

⑧



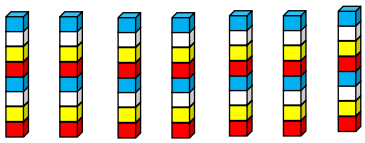
There are 5 octopuses with 8 legs.

There are 5 eights.

5 x 8 = 40 legs.

Show the repeated addition and multiplication number sentence you have used to solve each problem.

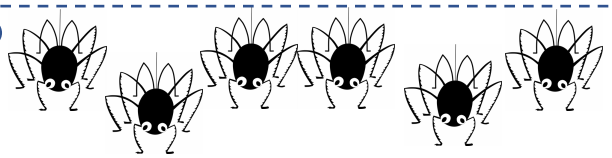
1. There are seven towers of 8 cubes.
How many cubes are there altogether?



2. There are nine jars with eight marbles in each.

How many marbles are there altogether?

3.

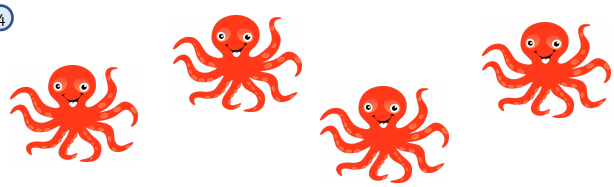


There are _____ spiders with _____ legs on each.

There are _____ eights.

_____ x _____ = _____ legs.

4.



There are _____ octopuses with _____ legs on each.

There are _____ eights.

_____ x _____ = _____ legs.

5. What do you notice about multiplying by 4 and multiplying by 8? Explain.

2 → x4 → 8

_____ → x8 → _____

6. What do you notice about multiplying by 4 and multiplying by 8? Explain.

9 → x4 → _____

_____ → x8 → _____

7. What do you notice about multiplying by 4 and multiplying by 8? Explain.

8 → x4 → _____

_____ → x8 → _____

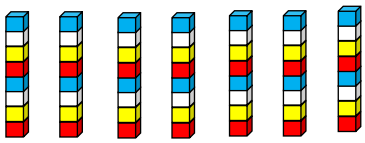
8. What do you notice about multiplying by 4 and multiplying by 8? Explain.

4 → x4 → _____

_____ → x8 → _____

Show the repeated addition and multiplication number sentence you have used to solve each problem.

1. There are seven towers of 8 cubes.
How many cubes are there altogether?



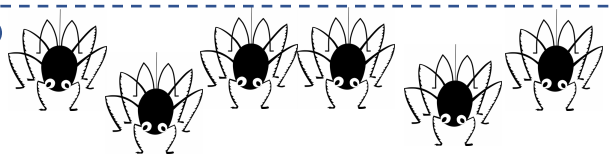
7 x 8 = 56

2. There are nine jars with eight marbles in each.

How many marbles are there altogether?

9 x 8 = 72

3.

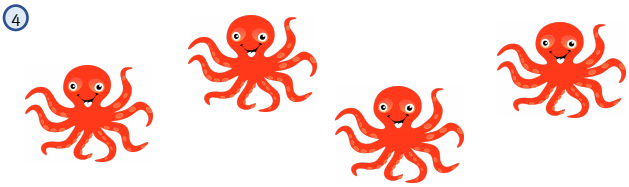


There are 6 spiders with 8 legs on each.

There are 48 eights.

8 x 6 = 48 legs.

4.



There are 4 octopuses with 8 legs on each.

There are 32 eights.

4 x 8 = 32 legs.

5. What do you notice about multiplying by 4 and multiplying by 8? Explain.

2 → x4 → 8

2 → x8 → 16

6. What do you notice about multiplying by 4 and multiplying by 8? Explain.

9 → x4 → 36

9 → x8 → 72

7. What do you notice about multiplying by 4 and multiplying by 8? Explain.

8 → x4 → 32

8 → x8 → 64

8. What do you notice about multiplying by 4 and multiplying by 8? Explain.

4 → x4 → 16

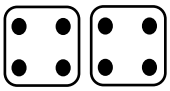
4 → x8 → 32

Show the number sentence you have used to work out the answer.

1. There are twenty-two towers of 8 cubes. How many cubes are there altogether?

2. There are forty-six jars with 8 marbles in each. How many marbles are there altogether?

3. I roll double fours sixty-five times. How many dots would I have seen altogether?



4. There are thirty-nine spiders with eight legs. How many legs are there?

5. A cinema ticket costs £8. A party of twenty-seven people buy a ticket. How much money do they pay altogether?

6. There are eighteen carrots planted in a row. There are 8 rows. How many carrots are there altogether?

Multiplying by 8 ☆☆☆ Fluency & Precision 3

Show the number sentence you have used to work out the answer.

1. There are twenty-two towers of 8 cubes. How many cubes are there altogether?

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Show the number sentence you have used to work out the answer.

There are twenty-two towers of 8 cubes.
How many cubes are there altogether?

20 x 8 = 160
2 x 8 = 16
160 + 16 = 176

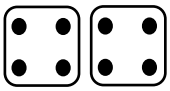
1

There are forty-six jars with 8 marbles in each.
How many marbles are there altogether?

40 x 8 = 320
6 x 8 = 48
320 + 48 = 368

2

I roll double fours sixty-five times.
How many dots would I have seen altogether?



60 x 8 = 480
5 x 8 = 40
480 + 40 = 520

3

There are thirty-nine spiders with eight legs.

How many legs are there?

30 x 8 = 240
9 x 8 = 72
240 + 72 = 312

4

A cinema ticket costs £8.
A party of twenty-seven people buy a ticket.
How much money do they pay altogether?

20 x 8 = 160
7 x 8 = 56
160 + 56 = 216

5

There are eighteen carrots planted in a row.
There are 8 rows. How many carrots are there altogether?

10 x 8 = 80
8 x 8 = 64
80 + 64 = 144

6

Multiplying by 8 ☆☆☆ Fluency & Precision 3

Show the number sentence you have used to work out the answer.

There are twenty-two towers of 8 cubes.
How many cubes are there altogether?

20 x 8 = 160
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4

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160 + 56 = 216

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There are 8 rows. How many carrots are there altogether?

10 x 8 = 80
8 x 8 = 64
80 + 64 = 144

6

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Zach and Rosie calculate 8 x 2.

Zach says:

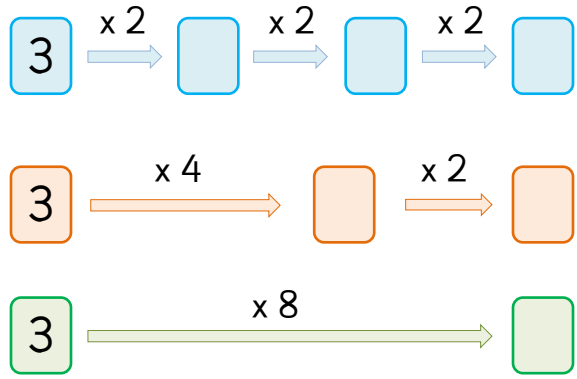
My method is to calculate 2 x 2 and 6 x 2 and add them together.

Rosie says:

My method is to calculate 2 x 4 x 2.

Whose method do you prefer? Explain why.

Here are function machines which start with the number 3.



What do you notice about each final answer?

Leanna knows the 4 times table but is still learning the 8 times table.

Which colour row should she use? Why?

Multiplying by 8 ☆ Reasoning & Problem Solving 3

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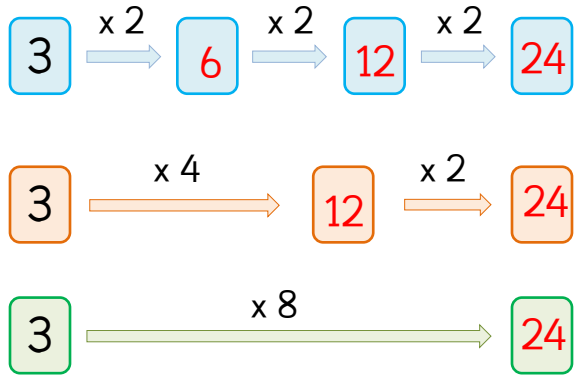
Rosie says:

My method is to calculate 2 x 4 x 2.

Whose method do you prefer? Explain why.

Possible answers: I prefer Zach's method because I know my 2 and 6 times tables.
I prefer Rosie's method because I know my 4 times table and can double numbers.

Here are function machines which start with the number 3.



What do you notice about each final answer?

Each time the final number (24) is 8 times greater than the starting number.

Leanna knows the 4 times table but is still learning the 8 times table.

Which colour row should she use? Why?

She should use the orange row because she can double each multiple of 4 to calculate a number multiplied by 8.

Multiplying by 8 ☆ Answers Reasoning & Problem Solving 3

Zach and Rosie calculate 8 x 2.

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I prefer Rosie's method because I know my 4 times table and can double numbers.

Here are function machines which start with the number 3.

3 x 2 6 x 2 12 x 2 24
3 x 4 12 x 2 24
3 x 8 24

What do you notice about each final answer?

Each time the final number (24) is 8 times greater than the starting number.

Leanna knows the 4 times table but is still learning the 8 times table.

Which colour row should she use? Why?

She should use the orange row because she can double each multiple of 4 to calculate a number multiplied by 8.

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Zach and Rosie calculate 8 x 5.

Zach says:

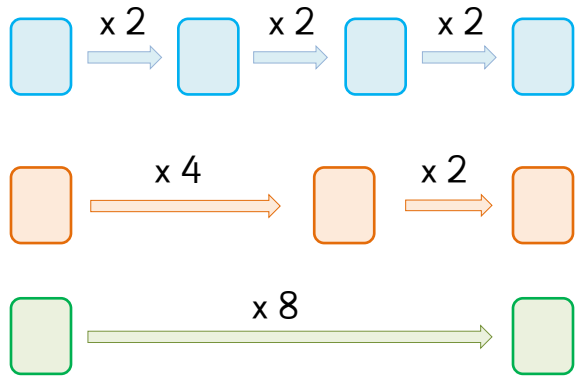
My method is to calculate 3 x 5 and 5 x 5 and add them together.

Rosie says:

My method is to calculate 5 x 4 x 2.

Whose method do you prefer? Explain why.

Start each function machine with the same number.



What do you notice about each final answer?

Leanna is still learning the 8 times table.

Which colour row should she use? Why?

Multiplying by 8 ☆☆ Reasoning & Problem Solving 3

Zach and Rosie calculate 8 x 5.

Zach says:

My method is to calculate 3 x 5 and 5 x 5 and add them together.

Rosie says:

My method is to calculate 5 x 4 x 2.

Whose method do you prefer? Explain why.

Start each function machine with the same number.

What do you notice about each final answer?

Leanna is still learning the 8 times table.

Which colour row should she use? Why?

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Zach and Rosie calculate 8 x 5.

Zach says:

My method is to calculate 3 x 5 and 5 x 5 and add them together.

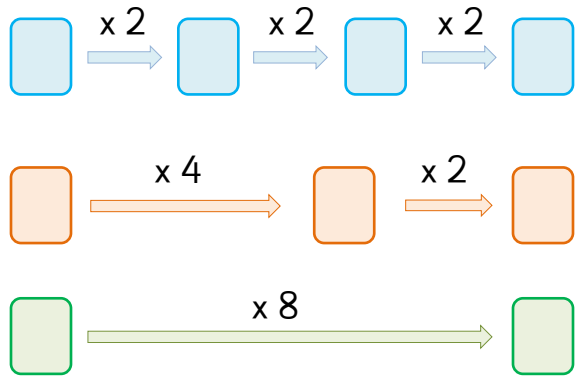
Rosie says:

My method is to calculate 2 x 5 x 4.

Whose method do you prefer? Explain why.

Possible answers: I prefer Zach's method because I know my 3 and 5 times tables.
I prefer Rosie's method because I know my 4 times table and can double numbers.

Start each function machine with the same number.



What do you notice about each final answer?

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Leanna is still learning the 8 times table.
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Multiplying by 8 ☆☆ Answers Reasoning & Problem Solving 3

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Rosie says:

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Whose method do you prefer? Explain why.

Possible answers: I prefer Zach's method because I know my 3 and 5 times tables.
I prefer Rosie's method because I know my 4 times table and can double numbers.

Start each function machine with the same number.

What do you notice about each final answer?

Each time the final number is 8 times greater than the starting number.

Leanna is still learning the 8 times table.
Which colour row should she use? Why?

She should use the orange row because she can double each multiple of 4 to calculate a number multiplied by 8.

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Zach and Rosie calculate 8 x 9.

Zach says:

My method is to calculate 4 x 9 and 4 x 9 and add them together.

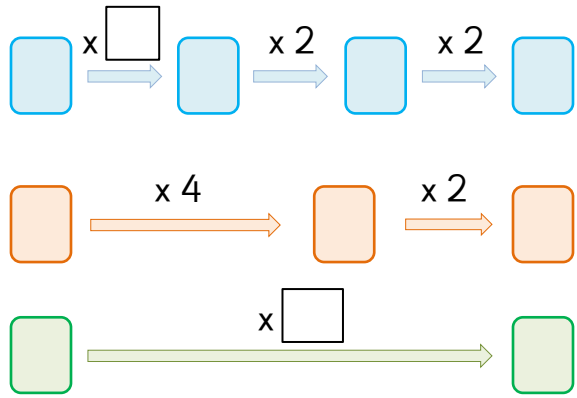
Rosie says:

My method is to calculate 3 x 3 x 2 x 2 x 2.

Whose method do you prefer? Explain why.

Write your own method to calculate 8 x 8.

Each function machine ends with the same number.



What should be the missing numbers so that each machine starts with the same number? Explain.

Leanna knows the 4 times table.

Which colour row should she use? Why?

Multiplying by 8 ☆☆☆ Reasoning & Problem Solving 3

Zach and Rosie calculate 8 x 9.

Zach says:

My method is to calculate 4 x 9 and 4 x 9 and add them together.

Rosie says:

My method is to calculate 3 x 3 x 2 x 2 x 2.

Whose method do you prefer? Explain why.

Write your own method to calculate 8 x 8.

Each function machine ends with the same number.

What should be the missing numbers so that each machine starts with the same number? Explain.

Leanna knows the 4 times table.

Which colour row should she use? Why?

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Zach says:

My method is to calculate 4 x 9 and 4 x 9 and add them together.

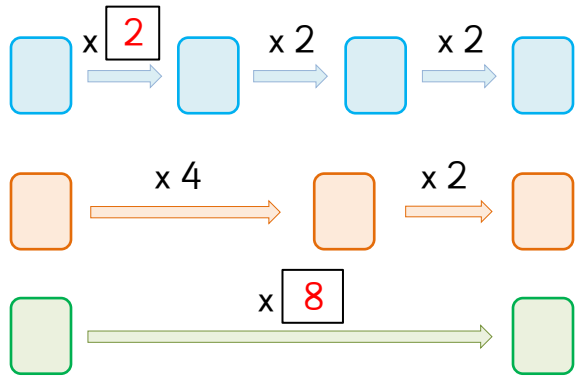
Rosie says:

My method is to calculate 3 x 3 x 2 x 2 x 2.

Whose method do you prefer?
Explain why.
Write your own method to calculate 8 x 8.

Possible answers: I prefer Zach's method because I know my 4 times table.
Rosie's method is good, as children can tell that they will use 4 times table and then double the answer, or they will use 3 times table and then double the answer.

Each function machine ends with the same number.



What should be the missing numbers so that each machine starts with the same number?
Explain.

If each time the machines start with the same number and make the same answer, then (we can see from the orange row) the final number is 8 times greater than the starting number.

Leanna knows the 4 times table.
Which colour row should she use? Why?

She should use the orange row because she can double each multiple of 4 to calculate a number multiplied by 8.

Multiplying by 8 ☆☆☆ Answers Reasoning & Problem Solving 3

Zach and Rosie calculate 8 x 9.

Zach says:

My method is to calculate 4 x 9 and 4 x 9 and add them together.

Rosie says:

My method is to calculate 3 x 3 x 2 x 2 x 2.

Whose method do you prefer?
Explain why.
Write your own method to calculate 8 x 8.

Possible answers: I prefer Zach's method because I know my 4 times table.
Rosie's method is good, as children can tell that they will use 4 times table and then double the answer, or they will use 3 times table and then double the answer.

Each function machine ends with the same number.

What should be the missing numbers so that each machine starts with the same number?
Explain.

If each time the machines start with the same number and make the same answer, then (we can see from the orange row) the final number is 8 times greater than the starting number.

Leanna knows the 4 times table.
Which colour row should she use? Why?

She should use the orange row because she can double each multiple of 4 to calculate a number multiplied by 8.

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