



1)

Factors of 12	Factors of 40	Factors of 36	Factors of 24
2	2	2	2
4	5	12	8
3	8	4	12
12	4	9	4
	10	3	3

2)

Factors of 12	Factors of 40	Factors of 36	Factors of 24
1	1	1	1
6	20	36	24
	40	18	6
		6	

- 1) Alfie has made a mistake because 20 multiplied by any number will not give a product of 36. 20 is over half of 36 and therefore could not be a factor of this number. 18 is the greatest factor of 36 apart from 36 and 1.
- 2) a) This is false. Square numbers have an odd number of factors because one of their factors is always multiplied by itself and we only count each number as a factor once. 9 is a square number and its factors are 1, 9 and 3.
- b) This is false. 48 has 10 factors, but 60, 72, 84, 90 and 96 all have 12 factors.
- c) This is false. 96 has 12 factors, but 113 only has 2 factors – 1 and itself, 113.



- 1) Factors of 36 – 1, 2, 3, 4, 6, 9, 12, 18, 36
 Factors of 30 – 1, 2, 3, 5, 6, 10, 15, 30
 Rebecca's sister could be 2, 4 or 9 years old.



- 2) a) Possible numbers are:
- | | | |
|---------------|---------------|---------------|
| 10, 11 and 12 | 40, 41 and 42 | 70, 71 and 72 |
| 20, 21 and 22 | 50, 51 and 52 | 80, 81 and 82 |
| 30, 31 and 32 | 60, 61 and 62 | 90, 91 and 92 |

- b) Look for explanations where children identify that only multiples of 5 are going to have 5 as a factor. All numbers will have 1 as a factor. However, only even numbers will have 2 as a factor, therefore the multiples of 5 must be those that end with a 0 as the third number (and therefore the first number) must be even.

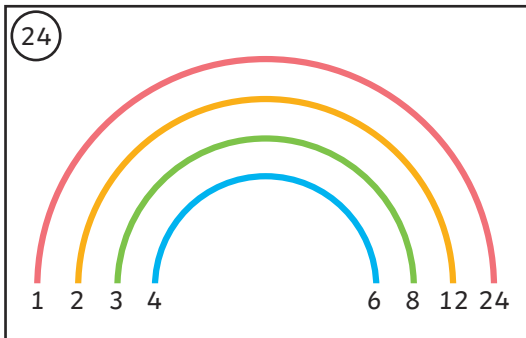
1) Sort these numbers into the correct columns. Remember: they might be factors of more than one number.



2, 5, 8, 12, 4, 10, 9, 3

Factors of 12	Factors of 40	Factors of 36	Factors of 24

2) Look at the table from question 1. Which factors are still missing for each number?
Draw factor rainbows, like the example, to help you identify missing factors and then add them to the table below.



Factors of 12	Factors of 40	Factors of 36	Factors of 24

3) Tatsiana wants to use a systematic way to identify factors to make sure she doesn't miss any. Can you show a systematic way of identifying all the factors of 48? You could use a factor rainbow or a different method.



- 1) Alfie is identifying the factors of 36. He says 20 is factor of 36. Can you explain what mistake he has made?

- 2) Are these statements true or false? Explain your thinking.

- a) Factors come in pairs so all numbers have an even number of factors.

- b) 48 has more factors than any other number below 100.

- c) Larger numbers have more factors.

- 1) Rebecca says, "This year, my sister's age is a factor of 36. Next year, her age will be a factor of 30." How old could she be?



- 2) Rafael says,

"I am thinking of 3 consecutive numbers less than 100. The first number has 5 as one of its factors, the second number has 1 as a factor and the third number has 2 as one of its factors."



- a) What could the three consecutive numbers be? Can you find all possible sets of numbers?

Can you explain how you solved the problem?

Diving into Mastery



Factors

Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:



Diving



Deeper



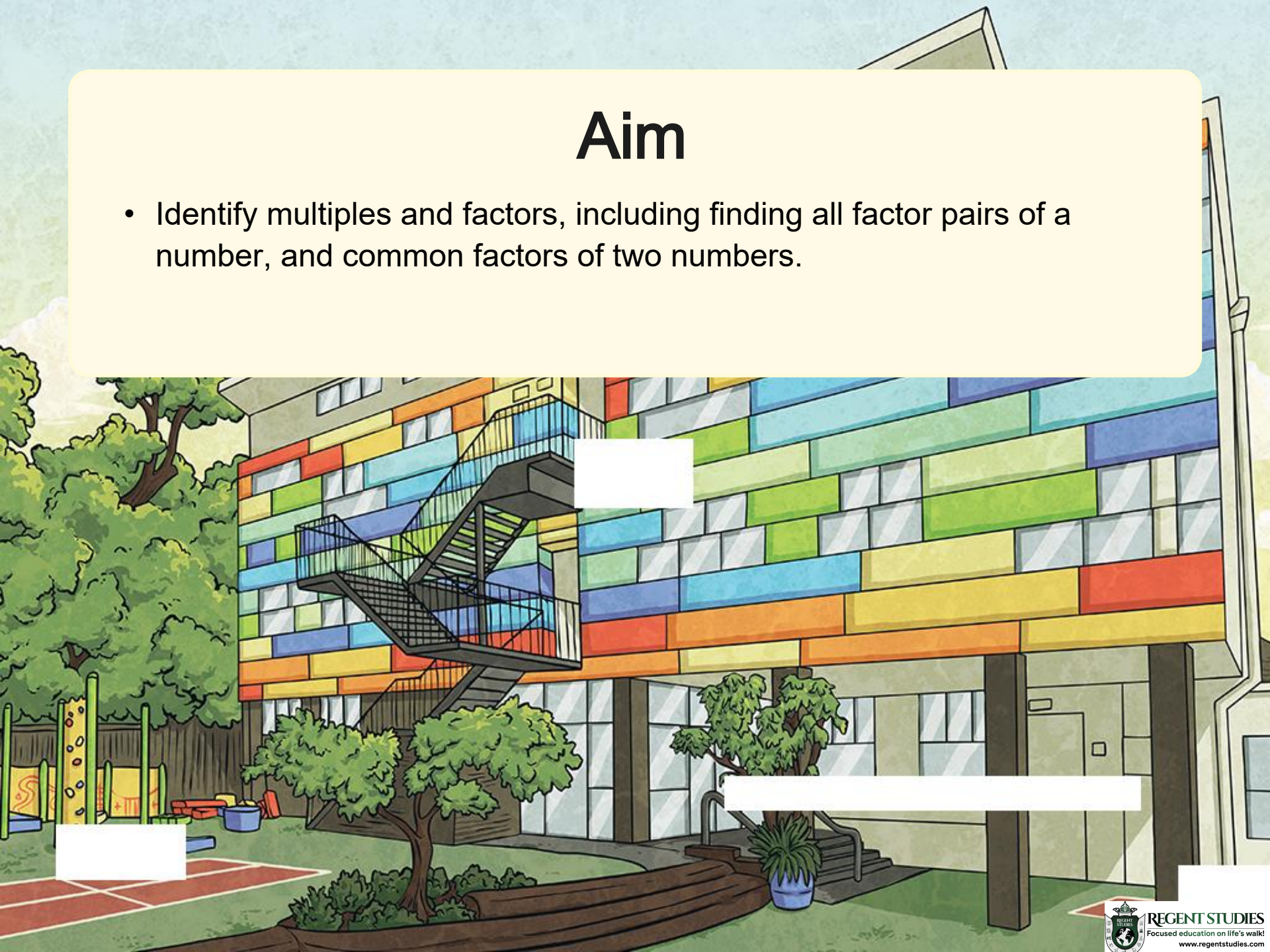
Deepest

These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

Aim

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.





Sort these numbers into the correct columns.
Remember: they might be factors of more than one number.

2 4 3 7 10 6 5

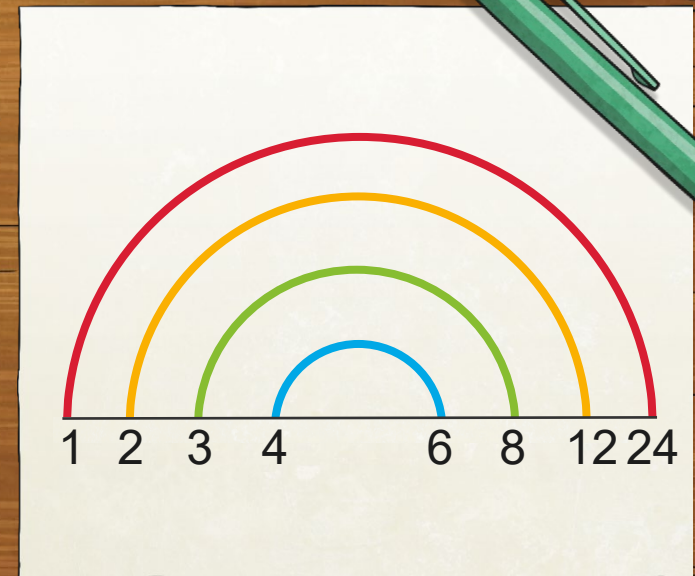
Factors of 15	Factors of 20	Factors of 24	Factors of 35
3	2	2	5
5	4	3	7
	5	4	
	10	6	



Look at the table. Which factors are missing for each number?

Draw factor rainbows, like the example, to help you identify missing factors and add them to the table.

Factors of 15	Factors of 20	Factors of 24	Factors of 35
1	1	1	1
3	2	2	5
5	4	3	7
15	5	4	35
	10	6	
	20	8	
		12	
		24	





Lydia has written down all the factors of 30 she can think of.

Can you help Lydia to use a more systematic approach to identifying all factors of numbers? Use your method to identify which factor she has missed.

Lydia

Factors of 30:

1

10

5

30

2

15

6





Lydia has missed the factor 3.

Working through numbers in a consecutive order from 1 up to half of the number can help to make sure you do not miss any factors.

Lydia

Some people like to write factors as multiplication pairs:

10

~~1~~ 30

~~2~~ 15

~~3~~ 10

5 6

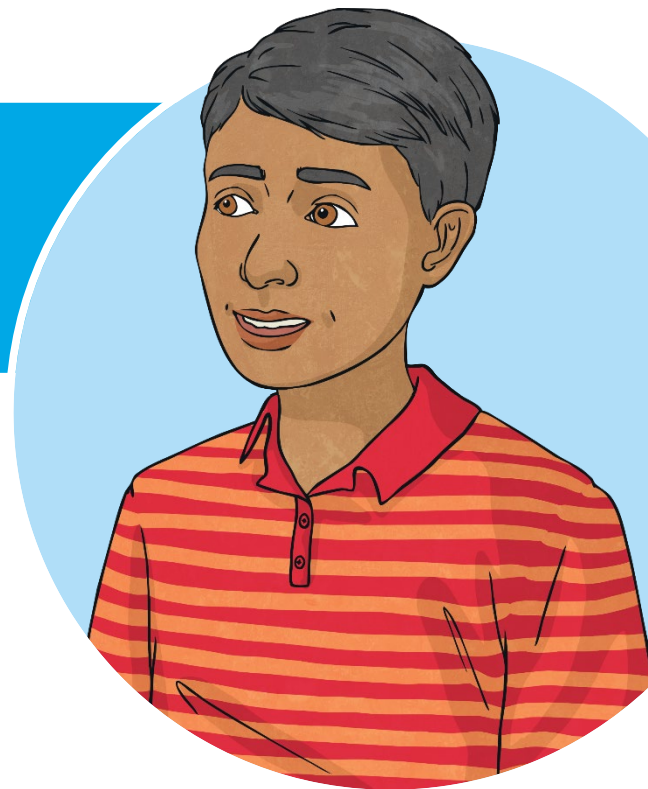
6

This might be in a list or as a table.





Michel is identifying the factors of 40. He says that 25 and 15 are factors of 40. Explain the mistake that Michel has made.



○ Factors are whole numbers that can be multiplied by another factor to make the given number or product.

○ $\text{factor} \times \text{factor} = \text{product}$

○ Michel is thinking of numbers that add together to make 40, rather than factors.



Are these statements true or false? Explain your thinking.

This is false. Odd and even numbers can have the same number of factors. For example, 21 has 4 factors and so does 22.

This is true. Every number has 1 as a factor because it is the product of 1 and itself, for example, $1 \times 22 = 22$.

Odd numbers have fewer factors than even numbers.

Every number has 1 as a factor.



Rosy says,

“This year, my brother’s age is a factor of 24. Next year, his age will be a factor of 63.”

How old could he be?



6, 8, 12, 24
1, 63



Ronan says,

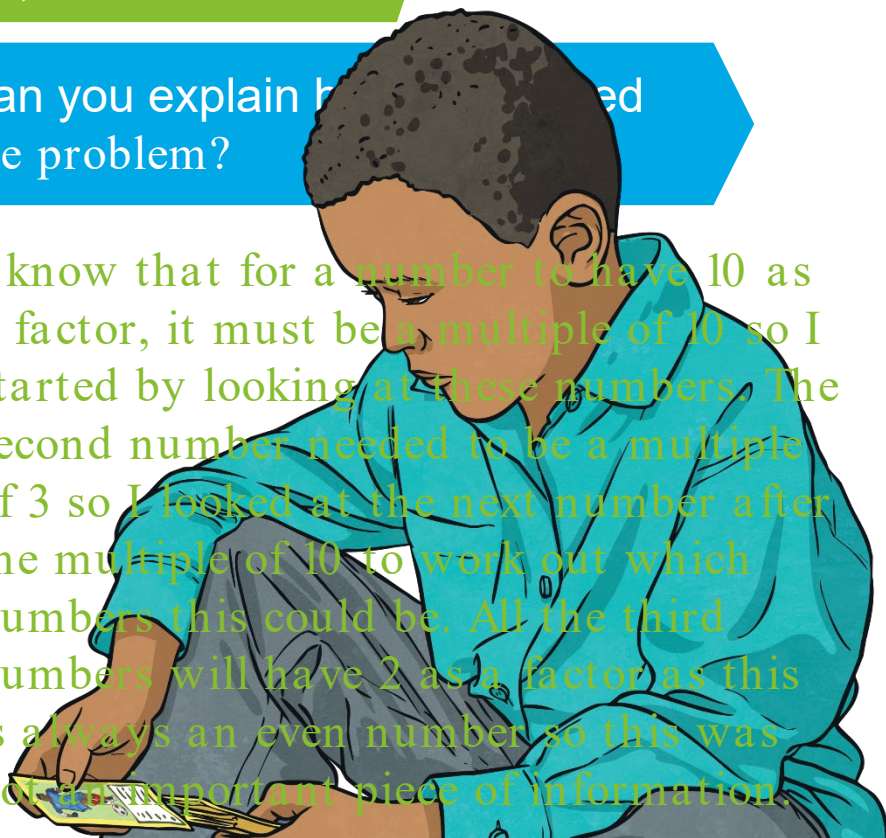
“I am thinking of 3 consecutive numbers less than 100. The first number has 10 as one of its factors, the second number has 3 as a factor and the third number has 2 as one of its factors.”

What could the three consecutive numbers be?
Can you find all possible sets of numbers?

Possible sets are:
20, 21 and 22
50, 51 and 52
80, 81 and 82

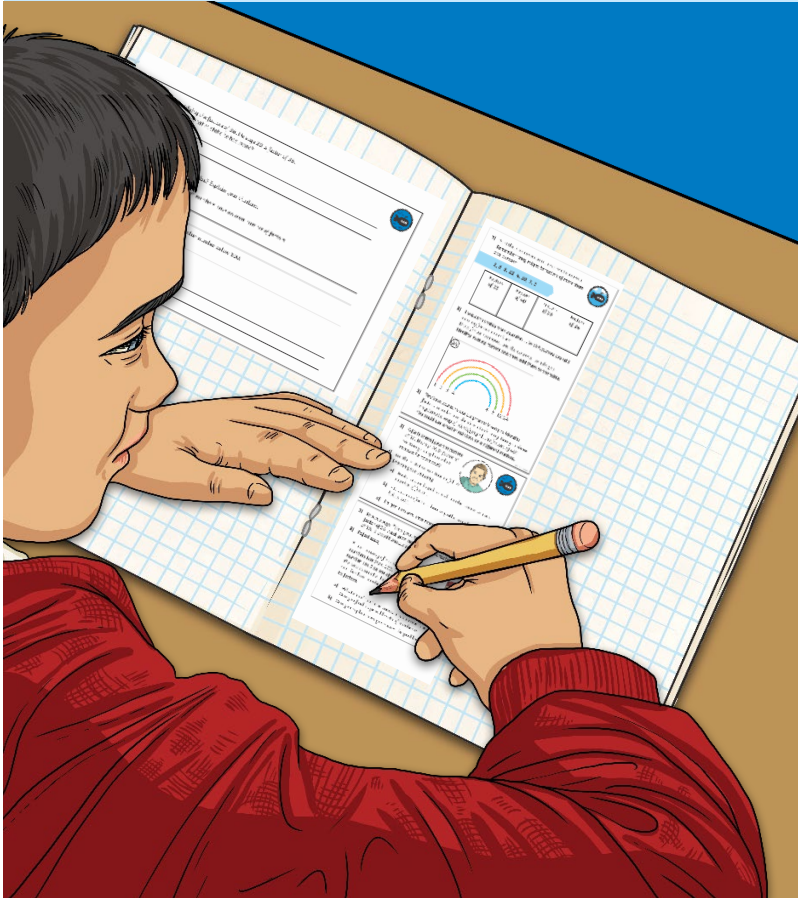
Can you explain how you solved the problem?

I know that for a number to have 10 as a factor, it must be a multiple of 10 so I started by looking at these numbers. The second number needed to be a multiple of 3 so I looked at the next number after the multiple of 10 to work out which numbers this could be. All the third numbers will have 2 as a factor as this is always an even number so this was not an important piece of information.



Factors

Dive in by completing your own activity!



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2, 5, 8, 12

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3) Tattiana wants to use a systematic way to identify factors to make sure she doesn't miss any. Can you show a systematic way of identifying all the factors of 48? You could use a factor rainbow or a different method.

1) Rebecca says, "I am thinking of a number less than 50. The second number and the third are its factors."

a) What could the number be?
Can you show how you know?

2) Rajat says, "I am thinking of a number less than 100. The first and second numbers are its factors."

a) What could the number be?
Can you show how you know?

1) Alfie is thinking of a number. He says, "I am thinking of a number less than 100. The first and second numbers are its factors."

a) What could the number be?
Can you show how you know?

2) Are these numbers factors of 48?
a) Factors of 48
b) 48 has factors 1, 2, 3, 4, 6, 8, 12, 16, 24, 48.
c) Large numbers are not factors of 48.

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a) What could the number be?
Can you show how you know?

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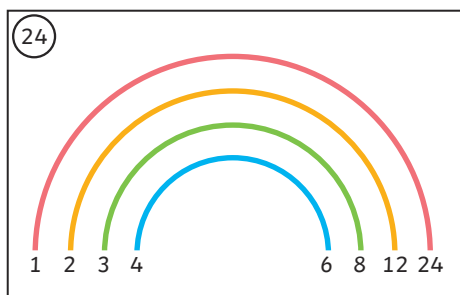
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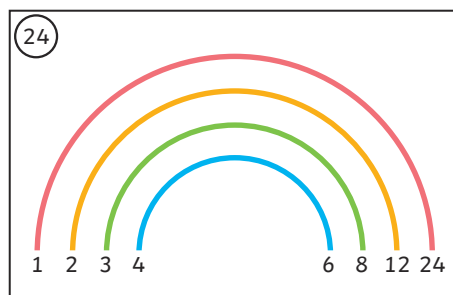
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