Patterns and Algebra: Key Skill 21

YEAR 4

Find missing numbers in number sentences involving addition or subtraction on 1 or both sides of the equals sign

A **number sentence** is an equation. It uses numbers and symbols to describe a maths problem.

A **fact family** is a group of related facts in addition and subtraction, and multiplication and division. It helps children understand the relationship between operations.

4 + ▲ = 10

▲ + 4 = 10

10 – 4 = ▲

10 – ▲ = 4

These skills will be used by the children for the rest of their maths careers! To find missing numbers, we focus on the idea of equivalence and the role of the equals (=) sign. Remembering that the equals sign means 'the same on both sides' makes it easier to find missing numbers.

Children use their knowledge of numbers to find what is missing. Strategies include:

- guess what the missing number is, and test it to see if the equation works with that number
- use the fact family to help solve the question.

The key is to be able to explain ***how*** they got their answer (show working out).

Here are some examples of equations with missing numbers.

4 + ▲ = 16 18 – ▲ = 5 25 = ▲ + 21 75 = 130 – ▲

Using playing or Uno cards, pull out 2 numbers and make a number sentence. Swap the cards around and see how many number sentences you can make using addition and subtraction. Solve your number sentences and find your mystery numbers.

WEB LINKS go to:

Notes: Finding missing numbers

Notes: Finding missing numbers guide

Video: Finding a missing part

Video: Finding missing numbers in subtraction

Patterns and Algebra: Key Skill 22

YEAR 4

Investigate and use the features of odd and even numbers

Odd numbers are any number ending in 1, 3, 5, 7 and 9.

Even numbers are any whole number ending in 0, 2, 4, 6, and 8.

Working with odd and even numbers helps children to build their mental strategies which helps with speed and efficiency when solving maths questions.

Addition

Even + even = even
Even + odd = odd
Odd + odd = even

Subtraction

Even – even = even
Odd – odd = even
Even – odd = odd

Mutliplication

Even x even = even
Even x odd = odd
Odd x odd = odd

Division

Even ÷ even = even
Even ÷ odd = even
Odd ÷ odd = odd

Test these rules out and see if they are always true. Are there any number combinations that do not work for these rules?

WEB LINKS go to:

Notes: Odd and even numbers

Video: Odd and even number

Patterns and Algebra: Key Skill 23

YEAR 4

Find, continue and describe number patterns that use multiplication

Number patterns are patterns created by numbers.

Patterns are formed by **rules**. A **rule** is used to work out the value of any part of the pattern. Rules help to continue patterns.

Patterns help children to apply rules, check answers, and see relationships between numbers. Children learn a lot about numbers and build strong operation skills when working with patterns.

Children work with skip counting patterns and look at a sequence of numbers and try to figure out which multiple it is increasing or decreasing by. They will usually need to find missing numbers in a pattern and then write the rule.

Children will first be able to work out the gaps in a pattern, then the numbers further along in the pattern e.g. the 10th number in the pattern. Children sometimes prefer to work with addition and avoid multiplication. This makes working past the numbers they see hard and children often find it difficult to find numbers further along in the pattern e.g. the 10th number.

Use a 100s chart to map out a pattern and work out what the 10th number in a pattern you make would be. (Here's a 100s chart you can print.)

Here is an example of a repeating pattern.

4, 8, ___ , 16, ___ , ___ , 28

The missing numbers are 12, 20 and 24

What would be the 10th number (or term) in this pattern?
The rule is: 'increasing by 4' so 4 x 10 = 40.

Answer: 40

WEB LINKS go to:

Notes: Number patterns

Video: Finding multiplication patterns

Patterns and Algebra : Key Skill 24

YEAR 4

Find missing numbers in number sentences involving 1 operation of multiplication or division

A **number sentence** is an equation. It uses numbers and symbols to describe a maths problem.

Multiplication is a process of repeatedly adding the same number a given amount of times. Multiply, product of, times and lots of all mean the same thing.

Division is to share into equal groups or parts. Divide, split, quotient, distribute, share equally and separate all mean the same thing.

A **fact family** is a group of related facts in addition and subtraction, and multiplication and division. It helps children understand the relationship between operations.

4 x ▲ = 20

▲ x 4 = 20

20 ÷ 4 = ▲

20 ÷ ▲ = 4

These skills will be used by the children for the rest of their maths careers! To find missing numbers, we focus on the idea of equivalence and the role of the equals (=) sign. Remembering that the equals sign means 'the same on both sides' makes it easier to find missing numbers.

Children use their knowledge of numbers to find what is missing. Strategies include:

- guess what the missing number is, and test it to see if the equation works with that number
- use the fact family to help solve the question.

The key is to be able to explain how they got their answer (show working out).

Here are some examples of equations with missing numbers.

4 x ▲ = 36 18 ÷ ▲ = 6 49 = ▲ x 7 15 = 150 ÷ ▲

Using playing or Uno cards, pull out 2 numbers and make a number sentence. Swap the cards around and see how many number sentences you can make using multiplication and division. Solve your number sentences and find your mystery numbers.

WEB LINKS go to:

Video: Finding patterns

Video: Finding missing numbers