Please note that there is more than one possible answer to fill the inverse column. Below is one example. Children's answers for column three should match that shown below.

Calculation	Inverse	Correct? ✓ or ✕
12 + 5 = 17	17 – 5 = 12	✓
15 – 3 = 10	**10 + 3 = 13**	✕
9 + 9 = 18	**18 – 9 = 9**	✓
6 + 12 = 19	**19 – 12 = 7**	✕
12 – 9 = 3	**3 + 9 = 12**	✓

Ben has swapped the addition symbol for a subtraction symbol without changing the position of the numbers.

His addition calculation would be 9 + 7 = 16 or 7 + 9 = 16.

16 - 9 = 7 or 16 - 7 = 9. Children should use equipment or a number line to correctly represent these inverse calculations.

3 + 17 = 20

17 + 3 = 20

20 – 3 = 17

20 – 17 = 3

Accept any representations that correctly match the bar model.

Introducing the Inverse

Adult Guidance with Question Prompts

Children use the inverse operation to check calculations.
They also need to know that using the inverse is just one way to check calculations. Children can also use equipment or a number line as appropriate.

What is the inverse of addition?

What is the inverse of subtraction?

What inverse calculation could you use to check Ben's first addition calculation?

Is there more than one possibility?

Which will you choose? Why?

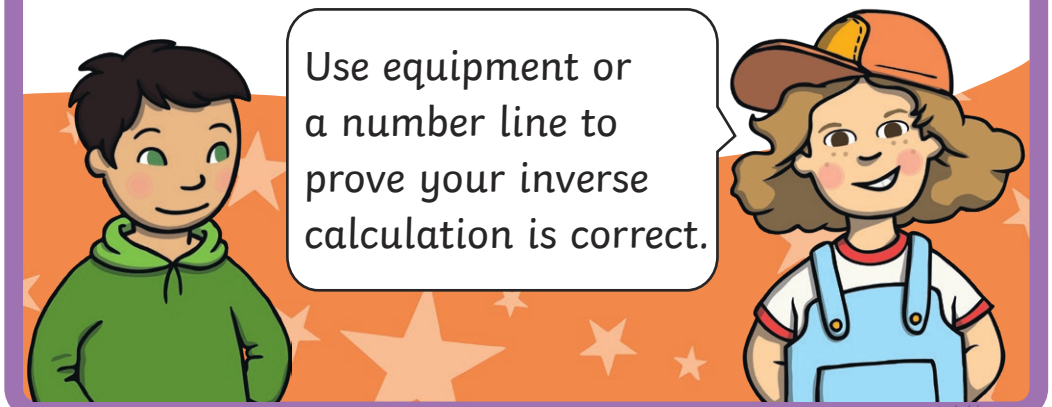
Can you use equipment or a number line to prove your inverse calculation is correct?

Which is the most efficient way to check? Why?

Introducing the Inverse

Help Ingrid check Ben's calculations using the inverse.

Calculation	Inverse	Correct? ✓ or ✗
12 + 5 = 17	17 - 5 = 12	✓
15 - 3 = 10		
9 + 9 = 18		
6 + 12 = 19		
12 - 9 = 3		



Introducing the Inverse

Adult Guidance with Question Prompts

Children use the inverse operation to check calculations.
They explain a mistake made by a child when writing his inverse calculation. Children may benefit from using equipment or a number line to find the inverse calculations and check Ben's calculation.

What mistake has Ben made with his calculation?

What should he have written?

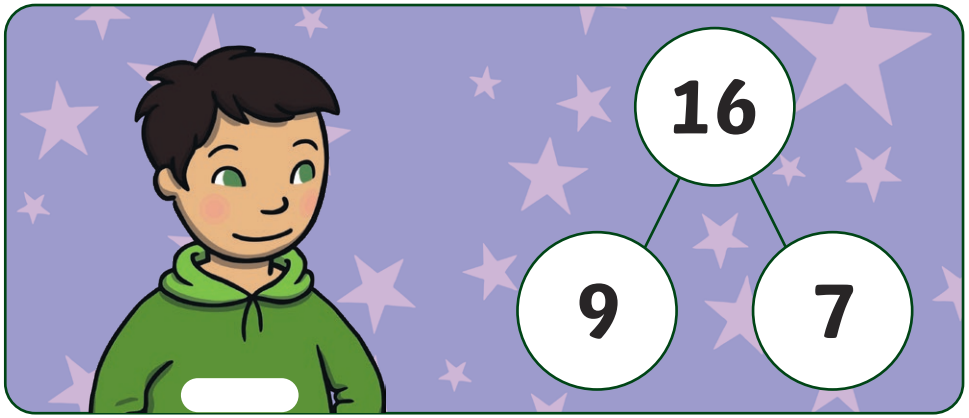
Is there more than one way of writing the inverse?

Apart from using the inverse, how else could we check his calculation?

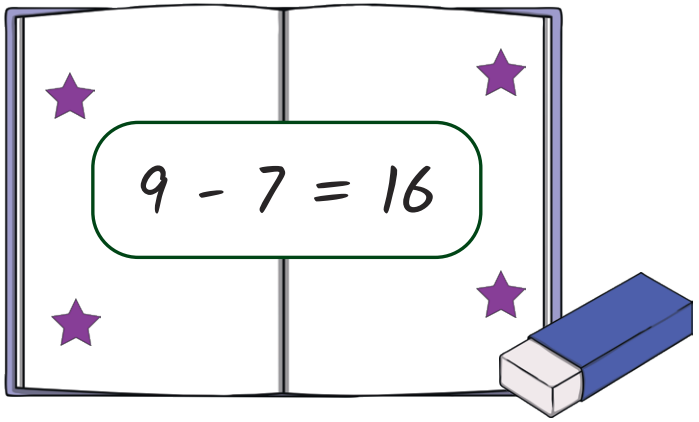
Why have you chosen to check it that way?

Introducing the Inverse

Ben used a part-whole model for this calculation:



To check his calculation, he wrote the inverse:



Explain Ben's mistake.

What would Ben's addition calculation be?

How many inverse calculations can you write for his addition calculation? Use equipment or a number line to check your calculations.

Introducing the Inverse

Adult Guidance with Question Prompts

Children use the inverse operation to check calculations. They use their knowledge of inverse operations and place value to solve a problem using larger numbers and represent their answers in different ways. Children could use base ten blocks to represent the calculation practically; they could also draw number lines or part-whole models.

What do you notice about the calculations at the top and the numbers in Ingrid's bar model?

How are they the same?

How are they different?

How can you use the calculations to help you?

What model could you draw to represent the calculations?

Can you represent each calculation with a number line/base ten blocks?

Introducing the Inverse

Ingrid knows:

12 + 7 = 19

7 + 12 = 19

She knows the inverses are:

19 - 7 = 12

19 - 12 = 7

Can you write four calculations to go with Ingrid's bar model?

Draw or make as many representations as you can that match the calculation shown in the bar model.

How many different pieces of equipment could you use or draw? Can you think of any other ways to represent it?