








# Addition and Subtraction: Introducing the Inverse

<p><b>Aim:</b> Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p> <p>To recognise and explain inverse relationships.</p>	<p><b>Success Criteria:</b> I can say what 'inverse' means.</p> <p>I can use equipment to explain why addition and subtraction are the inverse of each other.</p> <p>I can say what the inverse calculation is for an addition or subtraction calculation.</p>	<p><b>Resources:</b> <a href="#">Lesson Pack</a></p> <p>Base ten blocks</p> <p>Small manipulatives</p> <p>Number lines or number tracks</p>
	<p><b>Key/New Words:</b> Inverse, inverse relationship, reason, explain, demonstrate, addition, subtraction.</p>	<p><b>Preparation:</b> <a href="#">Roll the Dice Boards</a> – as required</p> <p><a href="#">Back to Where We Started Activity Sheet</a> – one per child</p> <p><a href="#">Ten-frames</a> - as required</p> <p><a href="#">Diving into Mastery Activity Sheets</a> - as required</p>

**Prior Learning:** It will be helpful if the children can add and subtract some one-digit and two-digit numbers. Children should be familiar with using equipment to represent calculations.

## Learning Sequence

	<p><b>Remember It:</b> Read to the children from the <a href="#">Lesson Presentation</a> about Azim rolling his dice. In pairs, children add or subtract Azim's digits to make as many numbers as they can from 1 – 25, writing down their calculation for checking purposes. Children can be challenged to fill a column, row, colour or the whole grid. If required, <a href="#">Roll the Dice Boards</a> can be printed off and given to children.</p>	
	<p><b>Meet Ingrid Inverse:</b> Children are introduced to Ingrid, who inverts everything. This can make her very helpful or a bit of a nuisance! They learn about what the term 'inverse' means. Ingrid helps Ben with his homework and provides lots of models to help understand the inverse calculation.</p>	
	<p><b>Ingrid Inverts Again:</b> Ingrid checks another calculation for Ben. Ask the children to explain clearly what Ingrid has done to check the calculation. They use equipment to prove that <math>19 - 6 = 13</math> and <math>13 + 6 = 19</math>. <b>Can the children use equipment to prove that addition and subtraction are the inverse of each other?</b></p>	
	<p><b>Trying Inverses:</b> Children have a go at writing inverse calculations so that they end up back where they started. They use a model to explain their calculations. <b>Can the children say what the inverse calculation is?</b></p>	
<div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>Children complete mathematical calculations, using models as stimuli. They then write some of their own and draw or make models to go with them. They explain inverses, using equipment.</p> </div> <div style="text-align: center;"> <p>Children complete mathematical calculations using more complex models as stimuli. They then write some of their own and draw or make models to go with them. They explain inverses, using equipment.</p> </div> <div style="text-align: center;"> <p>Children write mathematical calculations to replace the incorrect one. They then write calculations to match the models and explain inverses to a friend.</p> </div> </div>		

	<p><b>Diving into Mastery:</b> Schools using a mastery approach may prefer to use the following as an alternative activity. 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.</p> <p> Children check calculations using the inverse operation, then use equipment or a number line to prove their inverse calculation is correct.</p> <p> Children explain a mistake made by a child when writing his inverse calculation. They find the correct inverse calculations and use equipment or a number line to check a calculation.</p> <p> Children use their knowledge of inverse operations and place value to solve a problem using larger numbers and represent their answers in different ways.</p>	
	<p><b>Explain the Inverse:</b> Children demonstrate their understanding of the inverse by explaining it to Ben. They could role play this with a partner. <b>Can the children explain what 'inverse' means and why it is useful?</b></p>	

### Exploreit

- Makeit:** Children turn over two digit cards. One child uses them to generate an addition or subtraction number sentence. The other child then writes an inverse calculation. They then try to write more mathematical calculations using the same digits.
- Fillit:** Children draw a part-whole model or a bar model. They insert two numbers. Can their partner say what the third number should be to complete the fact? They can then use the model to write inverse mathematical calculations.
- Tellit:** Tell the children stories which create inverses. Can the children identify when you have created an inverse? For example, 'I went to the shops with 60p to buy some bread. I spent 35p on some rolls. How much money do I have now? On the way home, I found 35p. How much money do I have now?'
- Calculateit:** Children use a calculator to add two numbers together. They then subtract the same amount and see what happens. They could then explore what happens if they subtract a number and then add that amount back on.
- Learnit:** Children will find this visually exciting [Knowledge Organiser](#) a useful tool to support adding and subtracting numbers with up to two digits.