


Subject	Year	Month	
Mathematics	7	May	

Topic:

SOLVING EQUATIONS 4 LESSONS

Content (Intent)

<p>Prior Learning</p> <p>KEY STAGE 2:</p> <ul style="list-style-type: none"> - Filling the gap ; missing number problems - Order of operations <p>PREVIOUS UNIT</p> <ul style="list-style-type: none"> • Know the basic rules of algebraic notation • Expanding brackets • Substitution 	<p>Future Learning</p> <p>Y8</p> <ul style="list-style-type: none"> - Solving Equations- unknowns on both sides - Linear Graphs <p>Y9</p> <ul style="list-style-type: none"> - Circles- finding the radius - Solving inequalities - Linear simultaneous Equations <p>Y10</p> <ul style="list-style-type: none"> - Solving Quadratics and Quadratic inequalities
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<p>Objectives</p> <ul style="list-style-type: none"> • Given a function, establish outputs from given inputs and inputs from given outputs • Solve one-step equations when the solution is a positive integer or fraction • Solve two-step equations when the solution is a positive integer or fraction • Solve multi-step equations including the use of brackets when the solution is a positive integer or fraction <p><i>Only discuss equations with variable on ONE SIDE. In year 8 they will continue with variables on both</i></p>	<p>For teaching purposes</p> <p>POSSIBLE QUESTIONS</p> <ul style="list-style-type: none"> • Show me an equations with solution 14. And another • Jenny and Lenny are solving: $3(x - 2) = 51$. Who is correct? Explain <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="text-align: right; padding-right: 10px;"><i>Jenny's solution</i></td> <td style="padding-right: 20px;">$3(x - 2) = 15$</td> <td style="text-align: right; padding-right: 10px;"><i>Lenny's solution</i></td> <td style="padding-right: 20px;">$3(x - 2) = 15$</td> </tr> <tr> <td style="padding-right: 10px;">$\div 3$</td> <td>$= 5$</td> <td style="padding-right: 10px;"><i>Multiplying out brackets</i></td> <td>$= 15$</td> </tr> <tr> <td style="padding-right: 10px;">$x - 2 = 5$</td> <td></td> <td style="padding-right: 10px;">$3x - 6 = 15$</td> <td></td> </tr> <tr> <td style="padding-right: 10px;">$\div 2$</td> <td>$\div 2$</td> <td style="padding-right: 10px;">$+2$</td> <td>$+2$</td> </tr> <tr> <td style="padding-right: 10px;">$x = 7$</td> <td></td> <td style="padding-right: 10px;">$3x = 21$</td> <td></td> </tr> <tr> <td></td> <td></td> <td style="padding-right: 10px;">$\div 3$</td> <td>$\div 3$</td> </tr> <tr> <td></td> <td></td> <td style="padding-right: 10px;">$x =$</td> <td>$= 7$</td> </tr> </table> <p>POSSIBLE MISCONCEPTIONS</p> <ul style="list-style-type: none"> • may think that equations always need to be presented in the form $ax + b = c$ rather than $c = ax + b$. • may think that the solution is always positive and/or a whole number. • may get the use the inverse operations in the wrong order 	<i>Jenny's solution</i>	$3(x - 2) = 15$	<i>Lenny's solution</i>	$3(x - 2) = 15$	$\div 3$	$= 5$	<i>Multiplying out brackets</i>	$= 15$	$x - 2 = 5$		$3x - 6 = 15$		$\div 2$	$\div 2$	$+2$	$+2$	$x = 7$		$3x = 21$				$\div 3$	$\div 3$			$x =$	$= 7$
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		$x =$	$= 7$																										

Pedagogical notes (implementation) **How will understanding be assessed & recorded (Impact)**

<p>In order to visualize the concept at the start you could use the bar model, or the scales in balance model.</p> <table style="margin-left: 100px; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px 5px; text-align: center;">x</td> <td style="border: 1px solid black; padding: 2px 5px; text-align: center;">x</td> <td style="border: 1px solid black; padding: 2px 5px; text-align: center;">8</td> <td style="border: 1px solid black; padding: 2px 5px; text-align: center;">23</td> </tr> </table> <p>E.g $2x + 8 = 23$ using the Bar Model.</p> <table style="margin-left: 100px; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px 5px; text-align: center;">x</td> <td style="border: 1px solid black; padding: 2px 5px; text-align: center;">x</td> <td style="border: 1px solid black; padding: 2px 5px; text-align: center;">15</td> </tr> </table> <p><i>applying INVERSE operations in REVERSE order (keep balancing)</i></p> <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">$2x + 8 = 23$</td> <td></td> </tr> <tr> <td style="padding-right: 10px;">$- 8$</td> <td style="padding-left: 10px;">$- 8$</td> </tr> <tr> <td style="padding-right: 10px;">$2x = 15$</td> <td></td> </tr> <tr> <td style="padding-right: 10px;">$\div 2$</td> <td style="padding-left: 10px;">2</td> </tr> <tr> <td style="padding-right: 10px;">$x =$</td> <td style="padding-left: 10px;">7.5 (or $15/2$)</td> </tr> </table> <p><i>EVERY DIVISION CAN BE WRITTEN AS A FRACTION. → An answer could be left as a fraction. (It's better than nothing)</i></p>	x	x	8	23	x	x	15	$2x + 8 = 23$		$- 8$	$- 8$	$2x = 15$		$\div 2$	2	$x =$	7.5 (or $15/2$)	<p>End of Year Assessment in June/July</p> <p>BAM task 11 – Solving equations</p> <p style="background-color: #4F81BD; color: white; padding: 5px;">How can parents help at home?</p> <p>Maths Watch clips (Qualification KS3)</p> <p>A12, A17</p>
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Further reading/discussion

<p>Reading / Enrichment</p> <p>NCETM: The Bar Model</p> <p>NCETM: Algebra.</p> <p>NCETM: Glossary</p> <p>KM: Spiders and snakes.</p> <p>NRICH: Inspector Remorse</p> <p>NRICH: Quince, quonce, quance</p> <p>NRICH: Weighing the baby</p>	<p>Literacy</p> <p>Algebra, algebraic, algebraically</p> <p>Mapping diagram, Input, Output</p> <p>Unknown</p> <p>Equation</p> <p>Operation</p> <p>Solve</p> <p>Solution</p> <p>Brackets</p> <p>Symbol</p> <p>Substitute</p>	<p>Numeracy Links</p>	<p>Careers Links</p> <p>Aerospace Engineer</p> <p>Civil Engineer</p> <p>Economist</p> <p>Research Scientist</p>
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