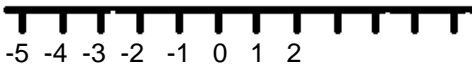
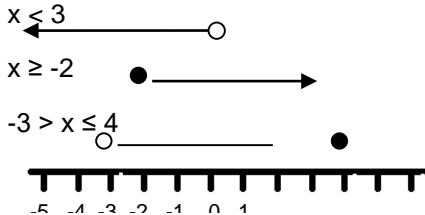
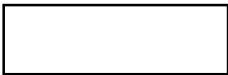


Code	Objective						
11.1	<b>Order positive and negative integers, decimals and fractions. Use the symbols =, ≠, ≤, ≥, &lt;, &gt;.</b> Put the following numbers in ascending order: 1, -3.2, 0.1, -17/5, 0.12 Step 1: Make all the numbers the same type of format 1, -3.2, 0.1, -3.4, 0.12 Step 2: Consider where the numbers are, on a number line  Step 3: Put the numbers in order Use the symbols: = Equals < Less than > Greater than ≤ Less than or equal to ≥ Greater than or equal to <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> Which symbol should go between these numbers?  -3   <input type="text"/>   -5 </div>						
	<b>Working with percentages</b> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 5px 0;">Non-calculator methods</div> <table> <tr> <td> <b>Work out 40% of £150</b>  Step 1: Work out 10% of 150 = <math>150 \div 10 = 15</math>  Step 2: Work out 40% of 150 = <math>15 \times 4 = £60</math> </td><td> <b>Increase £55 by 8%</b>  Step 1: Work out 1% of £55 = <math>55 \div 100 = 0.55</math>  Step 2: Work out 8% of 55 = <math>0.55 \times 8 = 4.40</math>  Step 3: Add the extra 4.40 to 55 = £59.40 </td><td> <b>What is 16 out of 25 as a percentage?</b>  Step 1: Express as a fraction <math>\frac{16}{25}</math>  Step 2: Consider how it can be changed to a fraction with a denominator of 100  <math>\frac{16}{25} = \frac{?}{100} = \frac{64}{100} = 64\%</math>  X4 </td></tr> </table> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 5px 0;">Calculator Methods</div> <table> <tr> <td> <b>Work out 33% of £160</b>  Step 1: Change 33 to a decimal = <math>33 \div 100 = 0.33</math>  Step 2: Multiply 0.33 by £160 = <math>0.33 \times 160 = £52.60</math> </td><td> <b>Increase £81 by 16.5%</b>  Step 1: Change 16.5 to a decimal, then add 1 = <math>0.165 + 1 = 1.165</math>  Step 2: Multiply £81 by 1.165 = <math>94.365</math>  Step 3: Round appropriately <math>94.365 = £94.37</math> </td><td> <b>What is 14 out of 42 as a percentage?</b>  Step 1: Express as a fraction <math>\frac{14}{42}</math>  Step 2: Divide the numerator by the denominator, then multiply by 100: <math>14 \div 42 \times 100 = 33.3333</math>  Step 3: Round appropriately: 33.3% </td></tr> </table>		<b>Work out 40% of £150</b> Step 1: Work out 10% of 150 = $150 \div 10 = 15$ Step 2: Work out 40% of 150 = $15 \times 4 = £60$	<b>Increase £55 by 8%</b> Step 1: Work out 1% of £55 = $55 \div 100 = 0.55$ Step 2: Work out 8% of 55 = $0.55 \times 8 = 4.40$ Step 3: Add the extra 4.40 to 55 = £59.40	<b>What is 16 out of 25 as a percentage?</b> Step 1: Express as a fraction $\frac{16}{25}$ Step 2: Consider how it can be changed to a fraction with a denominator of 100 $\frac{16}{25} = \frac{?}{100} = \frac{64}{100} = 64\%$ X4	<b>Work out 33% of £160</b> Step 1: Change 33 to a decimal = $33 \div 100 = 0.33$ Step 2: Multiply 0.33 by £160 = $0.33 \times 160 = £52.60$	<b>Increase £81 by 16.5%</b> Step 1: Change 16.5 to a decimal, then add 1 = $0.165 + 1 = 1.165$ Step 2: Multiply £81 by 1.165 = $94.365$ Step 3: Round appropriately $94.365 = £94.37$
<b>Work out 40% of £150</b> Step 1: Work out 10% of 150 = $150 \div 10 = 15$ Step 2: Work out 40% of 150 = $15 \times 4 = £60$	<b>Increase £55 by 8%</b> Step 1: Work out 1% of £55 = $55 \div 100 = 0.55$ Step 2: Work out 8% of 55 = $0.55 \times 8 = 4.40$ Step 3: Add the extra 4.40 to 55 = £59.40	<b>What is 16 out of 25 as a percentage?</b> Step 1: Express as a fraction $\frac{16}{25}$ Step 2: Consider how it can be changed to a fraction with a denominator of 100 $\frac{16}{25} = \frac{?}{100} = \frac{64}{100} = 64\%$ X4					
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11.3	<b>Understand and use the concept and vocabulary of inequalities</b>						
	Use the symbols: = Equals < Less than > Greater than ≤ Less than or equal to ≥ Greater than or equal to	x is less than 3 is written $x < 3$ x is greater than or equal to -2 is written $x \geq -2$ x is greater than -3 but less than or equal to 4 is written $-3 < x \leq 4$ On a number line: 					
11.4	<b>Simplify and manipulate algebraic expressions</b>						
	Simple rules to simplify: Adding and subtracting $a + a + a + a$ is simplified to $4a$ (you are repeatedly adding the same letter four times) $2a + 5a + 3a$ is simplified to $10a$	Simple rules to simplify: Multiplying and dividing $a \times a \times a \times a \times a$ is simplified to $a^5$ $2a \times 4a$ is simplified to $8a^2$ $3a \times 7b$ is simplified to $21ab$ $6a^2 \times 7a$ is simplified to $42a^3$					

	<p><math>2a + 7b + 9a + 2b</math> is simplified to <math>11a + 9b</math> (collect up the a and b terms separately)</p> <p><math>7d + 8e - 4d + 2e</math> is simplified to <math>3d + 10e</math> (the 4d is subtracted in this expression)</p> <p><math>2p - 5m - 7p + 9m</math> is simplified to <math>-5p + 4m</math> (you can also write it as <math>4m - 5p</math>)</p>	<p><math>24a \div 3</math> is simplified to <math>8a</math></p> <p><math>15ab \div 3a</math> is simplified to <math>5b</math></p> <p><math>45a^2b \div 9ab</math> is simplified to <math>5a</math></p>
	<p>Mixing it all up:</p> <p>Simplify: <math>\frac{5a - d + 3a - 3d}{2}</math></p> <p>Step 1: collect up the like terms on the numerator: <math>\frac{8a - 4d}{2}</math></p> <p>Step 2: divide each term by 2 (the denominator): <math>4a - 2d</math></p>	
11.5	<p><b>Model situations or procedures by translating them into algebraic expressions and formulae.</b></p> <p>Find an expression for the perimeter of the rectangle.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Step 1: imagine the width and height was given in numbers.</p> <p>What would you do to the numbers to work out the perimeter?</p> <p>Answer: add up all 4 sides.</p> <p>Step 2: Use the same method but use the letters given: <math>5a + 3a + 5a + 3a</math></p> <p>Step 3: simplify the expression is possible: <math>5a + 3a + 5a + 3a</math> is simplified to <math>16a</math></p> </div> <div style="text-align: center;"> <p>5a</p>  <p>3a</p> </div> </div>	
11.6	<p><b>Use algebraic methods to solve equations with one variable</b></p> <p>Solving equations means finding the value of the letter. The letter represents a number you don't know the value of.</p>	
	<p>1 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>x + 9 = 14</math></b></p> <p>Consider the value of x to make the equation true:</p> <p style="text-align: center;"><b><math>x = 5</math></b></p>	<p>1 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>5x = 40</math></b></p> <p>Consider the value of x to make the equation true:</p> <p style="text-align: center;"><b><math>x = 8</math></b></p>
	<p>1 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>29 - x = 14</math></b></p> <p>Consider the value of x to make the equation true:</p> <p style="text-align: center;"><b><math>x = 15</math></b></p>	<p>1 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>\frac{x}{5} = 4</math></b></p> <p>Consider the value of x to make the equation true:</p> <p style="text-align: center;"><b><math>x = 20</math></b></p>
	<p>2 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>2x + 7 = 16</math></b></p> <p>Step 1: Subtract 7 from both sides</p> <p style="text-align: center;"><math>2x = 9</math></p> <p>Step 2: Divide by 2</p> <p style="text-align: center;"><math>x = 4.5</math></p>	<p>2 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>2x + 7 = 16</math></b></p> <p>Work backwards, starting with 16</p> <p style="text-align: center;"><math>16 - 7 = 9</math></p> <p style="text-align: center;"><math>9 \div 2 = 4.5</math>      <math>x = 4.5</math></p>
11.7	<p>2 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>13 - 4x = 1</math></b></p> <p>Step 1: Consider what you subtract from 13 to get 1: Answer 12</p> <p>Step 2: This means <math>4x = 12</math></p> <p>Step 3: Divide 12 by 4 = <math>12 \div 4 = 3</math>      <b><math>x = 3</math></b></p>	<p>2 step equations: Solve to find the value of x:</p> <p style="text-align: center;"><b><math>5 = 4x + 9</math></b></p> <p>Step 1: Subtract 9 from both sides</p> <p style="text-align: center;"><math>-4 = 4x</math></p> <p>Step 2: Divide by 4</p> <p style="text-align: center;"><math>x = -4 \div 4</math> <math>x = -1</math></p>
	<p><b>Use algebraic methods to solve linear inequalities in one variable and represent them on a number line</b></p> <p>Solving inequalities is the same as solving equations but the answer is written as a range of values, rather than one single value</p>	
	<p>1 step equations: Solve to find the values of x</p> <p style="text-align: center;"><b><math>x + 3 &gt; 9</math></b></p> <p>Solve it like an equation, but use an &gt; symbol instead of an =</p> <p style="text-align: center;"><math>x &gt; 6</math></p>	<p>2 step equations: Solve to find the values of x</p> <p style="text-align: center;"><b><math>2x - 3 &gt; 5</math></b></p> <p>Solve it like an equation, but use an &gt; symbol instead of an =</p> <p style="text-align: center;"><math>2x &gt; 8</math> <math>x &gt; 4</math></p>

**Recognise linear functions of one variable**

**You are given that  $f(x) = 2x + 1$**

**Find the value of  $f(3)$**

Step 1 – Substitute the number 3 into the expression  $2x + 1$

$$F(3) = 2 \times 3 + 1$$

Step 2 – Work out the answer

$$F(x) = 7$$

**Solve  $f(x) = 11.5$**

Step 1 – Replace  $f(x)$  with the number given

$$11.5 = 2x + 1$$

Step 2 – Solve the equation to find the value of  $x$

$$10.5 = 2x$$

$$5.25 = x$$

I1.8

**Write a relationship between two quantities as a ratio**



Here are some counters.

**What is the ratio of Blue to yellow counters?**

Step 1 – Write the number of blue and yellow counters as a ratio (6:2)

Step 2 – Simplify the ratio (3:1)

What is the ratio of yellow to blue counters?

Step 1 – Write the number of yellow to blue counters (the other way around) (2:6)

Step 2 – Simplify the ratio (1:3)

What fraction of the counters is blue?

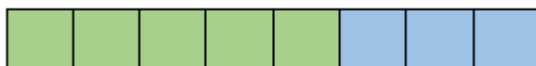
Step 1 – Write the ratio as a fraction (number of blue out of total counters) ( $\frac{6}{8}$ )

Step 2 – Simplify the fraction ( $\frac{3}{4}$ )

I1.9

**Relate the language of ratios and the associated calculations to the arithmetic of fractions.**

Understand how a fraction and ratio are linked.



What fraction of this bar is green?

Write the ratio of green to blue?

I1.10

I1.11	<p><b>Use ratio notation, including reduction to simplest form</b> Simplify the following ratios</p> <p>(a)        2 : 6               1 : 3</p> <p>(b)        25 : 10 : 35               5 : 2 : 7</p>
I1.12	<p>Solve problems involving simple direct proportion.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Makes 8 pieces</p> <p>100g of butter 4 eggs 240g of flour 80ml of milk 2 tsp of baking powder</p> </div> <p><b>Write a recipe for six pieces</b></p> <p>Step 1 – Find the recipe for two people (because two is a factor of six) by dividing all of the quantities by four</p> <p>50g of butter</p> <p>1 egg</p> <p>60g flour</p> <p>20ml milk</p> <p><math>\frac{1}{2}</math> tsp baking powder</p> <p>Step 2 – Find the recipe for six people by multiplying your answers by three</p> <p>150g butter</p> <p>3 eggs</p> <p>180g flour</p> <p>60ml milk</p> <p>1 <math>\frac{1}{2}</math> tsp baking powder</p>
I1.13	<p>Solve problems involving percentage change including percentage increase and decrease</p> <p><b>Increase £350 by 76%</b></p> <p>Step 1 – Find 76% of £350 using 10%, 5% and 1%</p> <p>10% = £35</p> <p>70% = £245 (£35x7)</p> <p>5% = £17.50 (£35 ÷ 2)</p> <p>1% = £3.50 (£35 ÷ 10)</p> <p>76% = £266 (add 70%, 5% and 1%)</p>

Step 2 – Add the 76 % you have found to the original amount

$$£350 + £266 = £616$$

**A man weighs 120kg**

**A month later he weighs 117kg**

**Find his percentage decrease.**

Step 1 – Use the formula  $\frac{\text{change}}{\text{original}} \times 100$

$$\begin{aligned}\text{Percentage change} &= \frac{120-117}{120} \times 100 \\ &= \frac{3}{120} \times 100\end{aligned}$$

Step 2 – Work out the answer and write it as a percentage (2.5%)

Draw and interpret pie charts

**The table below shows the results for a netball team in their league games.**

**Draw a pie chart to represent these data.**

Won	9
Drew	2
Lost	4

Step 1 – Find the total number of pieces of data

$$9 + 2 + 4 = 15$$

Step 2 – Divide  $360^\circ$  (the whole circle) by the answer to find the angle that each piece of data represents

$$15 \text{ games} = 360^\circ$$

$$1 \text{ game} = 24^\circ (\div 15)$$

Step 3 – Multiply each of the frequencies in the table by your answer to get the angle

$$\text{Won} = 9 \times 24 = 216^\circ$$

$$\text{Drew} = 2 \times 24 = 48^\circ$$

$$\text{Lost} = 4 \times 24 = 96^\circ$$

Use a protractor to carefully draw each angle on the pie chart, remembering to start each angle where the last one finished