

Fractions: Assessment of Mastery at KS1 and KS2

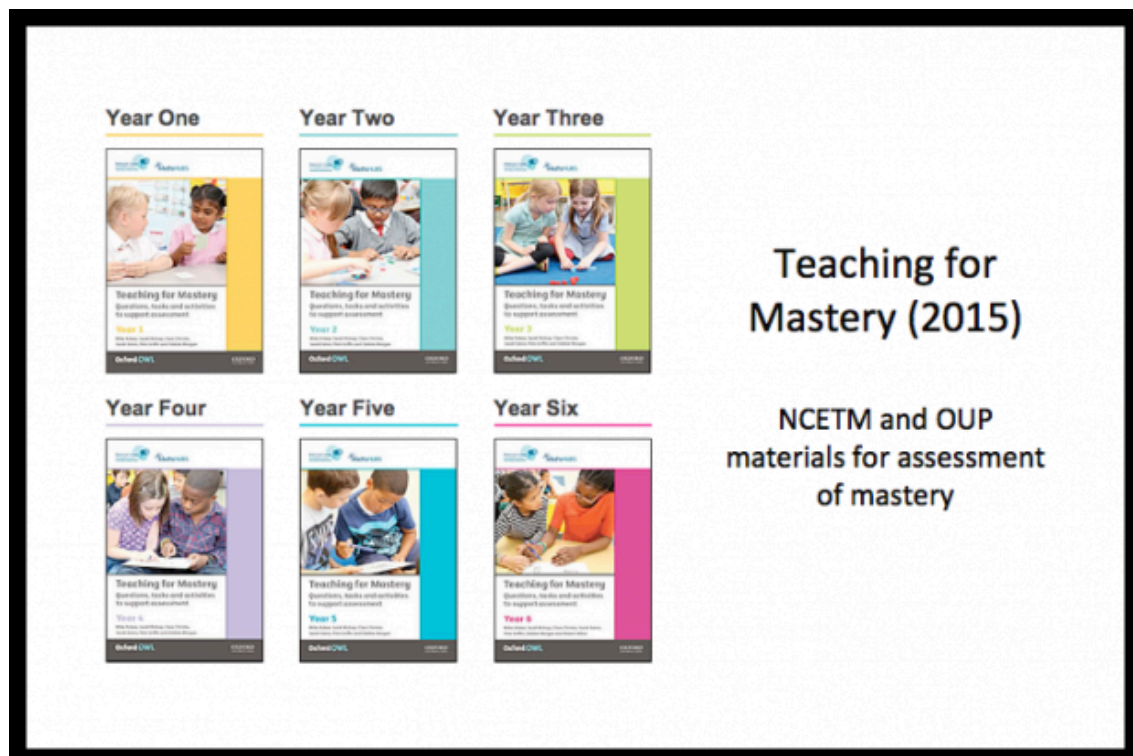


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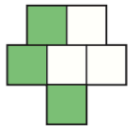

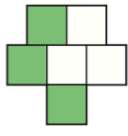

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KS1 and KS2

Mastery documents available from <https://www.ncetm.org.uk/resources/46689>

Year 1: Assessment of Mastery and Mastery with Greater Depth

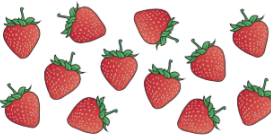

Teaching for Mastery: Questions, tasks and activities to support assessment

Fractions	
<p>Selected National Curriculum Programme of Study Statements</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> ■ recognise, find and name a half as one of two equal parts of an object, shape or quantity ■ recognise, find and name a quarter as one of four equal parts of an object, shape or quantity 	
<p>The Big Ideas</p> <p>Fractions express a relationship between a whole and equal parts of the whole. Ensure children express this relationship when talking about fractions. For example, 'If the circle (where the circle is divided into four equal parts with one part shaded) is the whole, one part is one quarter of the whole circle.'</p> <p>Halving involves partitioning an object, shape or quantity into two equal parts.</p> <p>The two parts need to be equivalent in, for example, area, mass or quantity.</p>	
<p>Mastery Check</p> <p>Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined, but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?'; 'What happens if ...?'; and checking that pupils can use the procedures or skills to solve a variety of problems.</p>	
Mastery	Mastery with Greater Depth
<p>Colour half of each whole shape:</p> <div style="display: flex; justify-content: space-around; align-items: center;">  </div> <p><i>Check that pupils do not think that just dividing a shape into any two pieces is halving but understand that they need to be equal pieces.</i></p>	<p>Which of these show half of each whole shape? Explain your reasoning.</p> <p><i>Children should talk about the two parts needing to be equal parts of the whole.</i></p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div>
<p>What fraction of the whole shape is shaded?</p> <p>Explain your reasoning.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>	<p>What fraction of the whole shape is shaded?</p> <p>Explain your reasoning.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>

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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>Shade to show half of the whole shape.</p> <div style="border: 1px solid black; width: 100px; height: 100px; margin: 10px auto;"> <div style="border: 1px solid black; width: 50px; height: 50px; position: relative;"> <div style="position: absolute; top: 0; left: 0; width: 100%; height: 100%; background-color: white;"></div> </div> </div>	<p>Shade each whole shape to show half in four different ways.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 100px; height: 100px; position: relative;"> <div style="position: absolute; top: 0; left: 0; width: 100%; height: 100%; background-color: white;"></div> </div> <div style="border: 1px solid black; width: 100px; height: 100px; position: relative;"> <div style="position: absolute; top: 0; left: 0; width: 100%; height: 100%; background-color: white;"></div> </div> </div>
<p>Circle half of this group of strawberries.</p> <div style="text-align: center;">  </div>	<p>What is half of this amount?</p> <div style="text-align: center;">  </div>
<p>There are 12 children in a class. Sammy says half of the class is 7. Do you agree?</p> <p>Explain your reasoning.</p>	<p>Half the children at a party are girls. How many children could be at the party? Give four different answers.</p> <p>Explain your reasoning.</p>

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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery					Mastery with Greater Depth																																		
<p>Sam and Tom share the fruit equally. There are 4 apples, 4 oranges, 2 pears and 2 bananas.</p> <p>How many of each fruit do they receive?</p> <p>Complete the table below.</p>  <table border="1" data-bbox="352 551 863 618"> <thead> <tr> <th></th> <th>Apples</th> <th>Oranges</th> <th>Bananas</th> <th>Pears</th> </tr> </thead> <tbody> <tr> <td>Sam</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Tom</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Apples	Oranges	Bananas	Pears	Sam					Tom					<p>Sam and Tom share the fruit equally. There are 4 apples, 3 oranges, 1 pear and 1 banana.</p> <p>How many of each fruit do they receive?</p> <p>Complete the table below.</p>  <table border="1" data-bbox="879 551 1390 618"> <thead> <tr> <th></th> <th>Apples</th> <th>Oranges</th> <th>Bananas</th> <th>Pears</th> </tr> </thead> <tbody> <tr> <td>Sam</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Tom</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Apples	Oranges	Bananas	Pears	Sam					Tom				
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Sam																																							
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	Apples	Oranges	Bananas	Pears																																			
Sam																																							
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<p>Four children share a pizza equally. Draw a diagram to show how much pizza each child gets.</p> <p>What fraction of the pizza does each child eat?</p>					<p>Four children share 2 pizzas equally. Draw a diagram to show how much pizza each child gets.</p> <p>What fraction of the pizzas does each child eat?</p>																																		
<p>Four children share a bag of 12 marbles equally. Draw a diagram to show how many marbles each child gets.</p> <p>What fraction of the bag of marbles does each child get?</p>					<p>Four children share two bags of 8 marbles equally. Draw a diagram to show how many marbles each child gets.</p> <p>What fraction of one bag of marbles does each child get?</p>																																		
<p>Complete this halving wall.</p> <table border="1" data-bbox="360 815 580 893"> <tr> <td colspan="2">20</td> </tr> <tr> <td>10</td> <td></td> </tr> </table> <p>Choose any number and create your own halving wall.</p>					20		10		<p>Complete this halving wall.</p> <p>What is the relationship between the top row and one part of your final row? Explain your reasoning.</p> <table border="1" data-bbox="887 860 1107 972"> <tr> <td colspan="2">20</td> </tr> <tr> <td>10</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table> <p>Choose any number and create your own halving wall.</p>					20		10																							
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Year 2: Assessment of Mastery and Mastery with Greater Depth

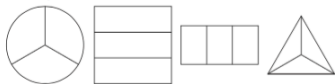
Teaching for Mastery: Questions, tasks and activities to support assessment

Fractions	
<p>Selected National Curriculum Programme of Study Statements</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> recognise, find, name and write fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ 	
<p>The Big Ideas</p> <p>Fractions involve a relationship between a whole and parts of a whole. Ensure children express this relationship when talking about fractions. For example, 'If the bag of 12 sweets is the whole, then 4 sweets are one third of the whole.'</p> <p>Partitioning or 'fair share' problems when each share is less than one gives rise to fractions.</p> <p>Measuring where the unit is longer than the item being measured gives rise to fractions.</p>	
<p>Mastery Check</p> <p>Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?', 'What happens if ...?', and checking that pupils can use the procedures or skills to solve a variety of problems.</p>	
Mastery	Mastery with Greater Depth
<p>Complete:</p> <p>Half of 12 is <input type="text"/></p> <p>$\frac{2}{4}$ of 12 is <input type="text"/></p> <p>$\frac{1}{4}$ of 20 = <input type="text"/></p> <p>$\frac{3}{4}$ of 20 = <input type="text"/></p>	<p>Complete:</p> <p>Half of <input type="text"/> is 6</p> <p>$\frac{2}{4}$ of <input type="text"/> is 6</p> <p>$\frac{1}{4}$ of <input type="text"/> = 5</p> <p>$\frac{3}{4}$ of <input type="text"/> = 15</p> <p>20 children are in a class and $\frac{1}{4}$ are girls. How many are boys?</p>

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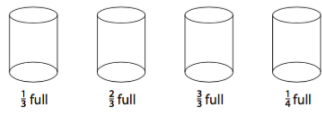

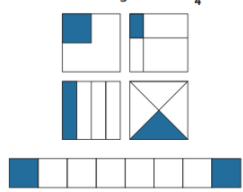
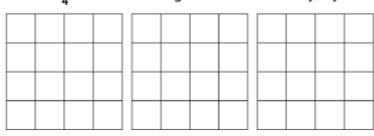
Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>Shade $\frac{1}{3}$ of each shape.</p> 	<p>Use the pictures to complete the number sentences.</p> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{3}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{3}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{3}$</div> </div> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> </div> <p><input type="text"/> is less than <input type="text"/> <input type="text"/> < <input type="text"/></p> <p><input type="text"/> is greater than <input type="text"/> <input type="text"/> > <input type="text"/></p> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{3}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{3}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{3}$</div> </div> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> <div style="border: 1px solid black; padding: 2px;">$\frac{1}{4}$</div> </div> <p>$\frac{3}{4}$ is greater than $\frac{2}{4}$ $\frac{3}{4}$ is less than $\frac{3}{4}$</p>
<p>Jo bought a bag of 12 cherries. Jo ate half the number of cherries in the bag. How many cherries did Jo eat?</p>	<p>Jo bought a bag of cherries. Jo ate half the number of cherries in the bag. Jo had 7 cherries left. How many cherries did Jo buy?</p>
<p>Sam bought a bag of 18 cherries. Sam ate 6 cherries. What fraction of the bag of cherries did Sam eat?</p>	<p>Sam bought a bag of cherries. Sam ate 9 cherries and had 3 left over. What fraction of the bag of cherries did Sam eat?</p>

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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>If you count in steps of $\frac{1}{2}$ starting from 0, how many steps will it take to reach: 2, 4 or 6 What do you notice?</p>	<p>$\frac{1}{3}$ of 3 = 1 $\frac{1}{3}$ of 6 = 2 $\frac{1}{3}$ of 9 = 3 $\frac{1}{3}$ of 12 = Continue the pattern. What do you notice?</p>
<p>Shade the cylinders.</p>  <p><i>This may first be carried out as a practical activity.</i></p>	<p>Mark another fraction on this line. And another, and another.</p> 
<p>Which of these diagrams have $\frac{1}{4}$ of the whole shaded?</p>  <p>Explain your reasoning.</p>	<p>Colour in $\frac{1}{4}$ of each of these grids in a different way. Try to think of an unusual way.</p>  <p>How many squares did you colour each time?</p>

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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>Jayne says that the shaded part of the whole square below does not show a half because there are three pieces, not two. Do you agree?</p> <p>Explain your reasoning.</p> 	<p>What fraction is the red part of the whole circle?</p> <p>Explain your reasoning.</p> 

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Year 3: Assessment of Mastery and Mastery with Greater Depth

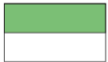






Teaching for Mastery: Questions, tasks and activities to support assessment

Fractions	
<p>Selected National Curriculum Programme of Study Statements</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> count up and down in tenths; recognise that tenths arise from dividing an object into ten equal parts and in dividing 1-digit numbers or quantities by ten recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators recognise and show, using diagrams, equivalent fractions with small denominators add and subtract fractions with the same denominator within one whole (for example, $\frac{3}{7} + \frac{1}{7} = \frac{4}{7}$) compare and order unit fractions, and fractions with the same denominators solve problems that involve all of the above 	
<p>The Big Ideas</p> <p>Fractions are equal parts of a whole. Equal parts of shapes do not need to be congruent but need to be equal in area. Decimal fractions are linked to other fractions. The number line is a useful representation that helps children to think about fractions as numbers.</p>	
<p>Mastery Check</p> <p>Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?'; 'What happens if ...?'; and checking that pupils can use the procedures or skills to solve a variety of problems.</p>	
Mastery	Mastery with Greater Depth
<p>Six girls share three bars of chocolate equally. Four boys share two bars of chocolate equally.</p> <p>Does each girl get more chocolate, less chocolate or the same amount of chocolate as each boy?</p> <p>Draw a picture to show that your reasoning is correct.</p>	<p>Jo ate $\frac{1}{4}$ of a pizza and Sam ate $\frac{1}{2}$ of what was left. Mike ate the rest of the pizza. Draw a diagram to show how much pizza Jo, Sam and Mike each ate.</p>

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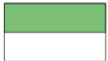






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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>True or false?</p> <p>Explain why.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>$\frac{1}{2}$</p> </div> <div style="text-align: center;">  <p>$\frac{1}{3}$</p> </div> <div style="text-align: center;">  <p>$\frac{1}{2}$</p> </div> <div style="text-align: center;">  <p>$\frac{1}{4}$</p> </div> </div>	<p>The shape is divided into 4 equal parts. Do you agree?</p> <p>Explain why.</p> <div style="text-align: center;">  </div>
<p>Shade in 0.7 of this rectangle.</p> <div style="text-align: center;">  </div>	<p>This is 0.4 or $\frac{2}{5}$ of a bag of marbles. How many marbles are in a full bag?</p> <div style="text-align: center;">  </div>
<p>Fill in the numerators to make the answer less than 1. Find three different ways to complete the calculation.</p> <p>$\frac{\quad}{8} + \frac{\quad}{8} =$</p>	<p>Fill in the numerators to make the calculation correct. How many ways can you do it?</p> <p>Explain how you know you have found them all.</p> <p>$\frac{\quad}{8} + \frac{\quad}{8} = 1$</p>

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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>True or false?</p> <p>Explain why.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>$\frac{1}{2}$</p> </div> <div style="text-align: center;">  <p>$\frac{1}{3}$</p> </div> <div style="text-align: center;">  <p>$\frac{1}{2}$</p> </div> <div style="text-align: center;">  <p>$\frac{1}{4}$</p> </div> </div>	<p>The shape is divided into 4 equal parts. Do you agree?</p> <p>Explain why.</p> <div style="text-align: center;">  </div>
<p>Shade in 0.7 of this rectangle.</p> <div style="text-align: center;">  </div>	<p>This is 0.4 or $\frac{2}{5}$ of a bag of marbles. How many marbles are in a full bag?</p> <div style="text-align: center;">  </div>
<p>Fill in the numerators to make the answer less than 1. Find three different ways to complete the calculation.</p> <p>$\frac{\quad}{8} + \frac{\quad}{8} =$</p>	<p>Fill in the numerators to make the calculation correct. How many ways can you do it?</p> <p>Explain how you know you have found them all.</p> <p>$\frac{\quad}{8} + \frac{\quad}{8} = 1$</p>

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Year 4: Assessment of Mastery and Mastery with Greater Depth






Teaching for Mastery: Questions, tasks and activities to support assessment

Fractions	
<p>Selected National Curriculum Programme of Study Statements</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> ■ recognise and show, using diagrams, families of common equivalent fractions ■ solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number ■ add and subtract fractions with the same denominator ■ recognise and write decimal equivalents of any number of tenths or hundredths ■ recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ ■ round decimals with one decimal place to the nearest whole number ■ compare numbers with the same number of decimal places up to two decimal places ■ solve simple measure and money problems involving fractions and decimals to two decimal places 	
<p>The Big Ideas</p> <p>Fractions arise from solving problems, where the answer lies between two whole numbers.</p> <p>Fractions express a relationship between a whole and equal parts of a whole. Children should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question <i>What fraction of the chocolate bar is shaded?</i> the pupil might say <i>Two sevenths of the whole chocolate bar is shaded.</i></p> <p>Equivalency in relation to fractions is important. Fractions that look very different in their symbolic notation can mean the same thing.</p>	
<p>Mastery Check</p> <p>Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined, but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?', 'What happens if ...?', and checking that pupils can use the procedures or skills to solve a variety of problems.</p>	
Mastery	Mastery with Greater Depth
<p>Put these fractions on the number line:</p> $\frac{2}{3}, \frac{1}{2}, \frac{3}{6}, \frac{4}{9}$  <p>Put these fractions on the number line:</p> $\frac{4}{5}, \frac{7}{10}, \frac{5}{10}, \frac{2}{5}$ 	<p>Insert the symbol $>$, $<$ or $=$ to make each statement correct.</p> <p>$\frac{2}{5}$ of 5 \bigcirc $\frac{1}{4}$ of 4</p> <p>$\frac{1}{7}$ of 7 \bigcirc $\frac{2}{7}$ of 14</p> <p>$\frac{2}{3}$ of 9 \bigcirc $\frac{1}{3}$ of 18</p> <p>Make up three similar statements using $>$, $<$ or $=$.</p>

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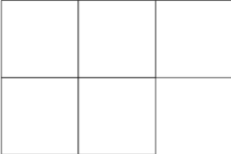
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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>What's the same? What's different?</p> <div style="display: flex; align-items: center; justify-content: space-around;">    </div> <p>Children should be able to express the ideas that:</p> <ul style="list-style-type: none"> ■ They are all divided into 4 equal parts. ■ Each part represents a quarter of the whole. ■ Each of the parts in the triangle are the same shape and area (congruent). ■ The shapes in the square are different but each has the same area (not congruent). ■ The bananas represent fractions of quantities. 	<p>Two paper strips are ripped. Identify which original paper strip is longer.</p> <p>Explain your answer.</p> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: orange; width: 100px; height: 40px; display: flex; align-items: center; justify-content: center;"> $\frac{1}{5}$ </div>  </div> <div style="display: flex; align-items: center;"> <div style="background-color: green; width: 100px; height: 40px; display: flex; align-items: center; justify-content: center;"> $\frac{1}{5}$ </div>  </div>
<p>Draw diagrams to show two fractions that are equivalent to $\frac{2}{8}$.</p>	<p>How many ways can you express $\frac{2}{8}$ as a fraction?</p>
<p>8 girls share 6 bars of chocolate equally. 12 boys share 9 bars of chocolate equally. Who gets more chocolate to eat, each boy or each girl? How do you know?</p> <p>Draw a diagram to explain your reasoning.</p>	<p>8 girls share 6 bars of chocolate equally. 12 boys share 9 bars of chocolate equally.</p> <p>Clare says each girl got more to eat as there were fewer of them. Rob says each boy got more to eat as they had more chocolate to share.</p> <p>Explain why Clare and Rob are both wrong.</p>

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Mastery	Mastery with Greater Depth
<p>Find:</p> <p>$\frac{1}{10}$ of 10</p> <p>$\frac{1}{10}$ of 20</p> <p>$\frac{1}{10}$ of 30</p> <p>$\frac{1}{10}$ of 40</p> <p>$\frac{1}{10}$ of 50</p> <p>What do you notice?</p> <p>If the picture represents $\frac{2}{12}$ of a rectangle, draw a picture of the whole rectangle.</p> <p>Can you draw it in two different ways?</p> 	<p>Captain Conjecture says,</p> <p>'To find a tenth of a number I divide by 10 and to find a fifth of a number I divide by 5.'</p> <p>Do you agree?</p> <p>Explain your reasoning.</p>  <p>If the picture represents $\frac{1}{3}$ of a shape, draw the whole shape.</p> 
<p>True or false?</p> <p>$\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$</p> <p>$\frac{1}{5} + \frac{2}{5} = \frac{3}{10}$</p> <p>$\frac{1}{5} + \frac{2}{5} = \frac{6}{10}$</p> <p>Explain your reasoning.</p>	<p>Peter wrote down two fractions. He subtracted the smaller fraction from the larger and got $\frac{1}{8}$ as the answer.</p> <p>Write down two fractions that Peter could have subtracted.</p> <p>Can you find another pair?</p>

Mastery	Mastery with Greater Depth														
<p>Match each fraction to its decimal equivalent.</p> <p>$\frac{1}{2}$ $\frac{4}{10}$ $\frac{3}{4}$ $\frac{1}{4}$</p> <p>0.25 0.75 0.4 0.5</p> <p>Circle the equivalent fraction to 0.25.</p> <p>$\frac{2}{5}$ $\frac{5}{2}$ $\frac{25}{100}$ $\frac{100}{25}$</p> <p>Round to the nearest whole number.</p> <p>$8\frac{3}{8}$ 8.38 8.83</p> <p>A soup recipe uses $\frac{3}{4}$ as many onions as carrots. Jo is making the soup and has 8 carrots.</p> <p>How many onions does Jo use?</p>	<p>Using these cards can you make a number between 4.1 and 4.61?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; background-color: yellow;">1</div> <div style="border: 1px solid black; padding: 5px; background-color: yellow;">4</div> <div style="border: 1px solid black; padding: 5px; background-color: yellow;">6</div> <div style="border: 1px solid black; padding: 5px; background-color: yellow;">.</div> </div> <p>What is the smallest number you can make using all four cards?</p> <p>What is the largest number you can make using all four cards?</p> <p>A soup recipe uses $\frac{3}{4}$ as many onions as carrots. Complete the table below.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Carrots</th><th>Onions</th></tr> </thead> <tbody> <tr><td>1</td><td></td></tr> <tr><td>2</td><td></td></tr> <tr><td>3</td><td></td></tr> <tr><td>4</td><td></td></tr> <tr><td>5</td><td></td></tr> <tr><td>6</td><td></td></tr> </tbody> </table> <p>Explain how you worked out the number of onions. Did you use the same method each time?</p>	Carrots	Onions	1		2		3		4		5		6	
Carrots	Onions														
1															
2															
3															
4															
5															
6															

Year 5: Assessment of Mastery and Mastery with Greater Depth

Teaching for Mastery: Questions, tasks and activities to support assessment

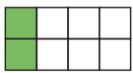

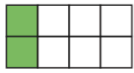
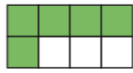

Fractions	
<p>Selected National Curriculum Programme of Study Statements</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> ■ identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ■ recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$) ■ add and subtract fractions with the same denominator and denominators that are multiples of the same number ■ multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams ■ recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'; and write percentages as a fraction with denominator 100, and as a decimal ■ solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25 	
<p>The Big Idea</p> <p>Representations that may appear different sometimes have similar underlying ideas. For example $\frac{1}{4}$, 0.25 and 25% are used in different contexts but are all connected to the same idea.</p>	
<p>Mastery Check</p> <p>Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined, but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?'; 'What happens if ...?'; and checking that pupils can use the procedures or skills to solve a variety of problems.</p>	
Mastery	Mastery with Greater Depth
<p>Make each number sentence correct using $=$, $>$ or $<$.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> $\frac{3}{4} \bigcirc \frac{1}{2}$ $\frac{3}{8} \bigcirc \frac{1}{2}$ $\frac{3}{4} \bigcirc \frac{3}{8}$ </div> <div style="text-align: center;"> $1\frac{3}{4} \bigcirc 2\frac{1}{2}$ $\frac{3}{2} \bigcirc 1\frac{1}{2}$ $3\frac{3}{4} \bigcirc 3\frac{3}{8}$ </div> <div style="text-align: center;"> $\frac{2}{4} \bigcirc \frac{1}{2}$ $\frac{2}{5} \bigcirc \frac{4}{10}$ $\frac{2}{5} \bigcirc \frac{5}{10}$ </div> </div>	<p>Write down two fractions where the denominator of one is a multiple of the denominator of the other.</p> <p>Which is the larger fraction?</p> <p>Explain your reasoning.</p>

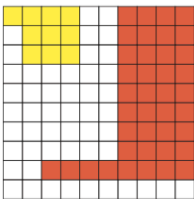
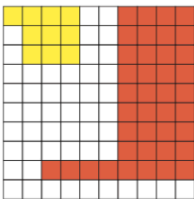
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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery	Mastery with Greater Depth
<p>Mark and label on this number line where you estimate that $\frac{3}{4}$ and $\frac{3}{8}$ are positioned.</p>	<p>Russell says $\frac{3}{8} > \frac{3}{4}$ because $8 > 4$.</p> <p>Do you agree?</p> <p>Explain your reasoning.</p>
<p>Choose numbers for each numerator to make this number sentence true.</p> $\frac{\square}{15} > \frac{\square}{10}$	<p>Which is closer to 1?</p> $\frac{7}{8} \text{ or } \frac{23}{24}$ <p>Explain how you know.</p>
<p>Chiz and Caroline each had two sandwiches of the same size.</p> <p>Chiz ate $1\frac{1}{2}$ of his sandwiches.</p> <p>Caroline ate $\frac{3}{4}$ of her sandwiches.</p> <p>Draw diagrams to show how much Chiz and Caroline each ate.</p> <p>Who ate more? How much more?</p>	<p>Chiz and Caroline each had two sandwiches of the same size.</p> <p>Chiz ate $1\frac{1}{4}$ of his sandwiches.</p> <p>Caroline ate $\frac{3}{4}$ of her sandwiches.</p> <p>Fred said Caroline ate more because 5 is the biggest number.</p> <p>Tammy said Chiz ate more because she ate a whole sandwich.</p> <p>Explain why Fred and Tammy are both wrong.</p>

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Mastery	Mastery with Greater Depth										
<p>Each bar of toffee is the same. On Monday, Sam ate the amount of toffee shown shaded in A. On Tuesday, Sam ate the amount of toffee shown shaded in B.</p> <p>How much more, as a fraction of a bar of toffee, did Sam eat on Tuesday?</p> <p>A  B </p>	<p>Each bar of toffee is the same. On Monday, Sam ate the amount of toffee shown shaded in A. On Tuesday, Sam ate the amount of toffee shown shaded in B.</p> <p>A  B </p> <p>Sam says he ate $\frac{7}{8}$ of a bar of toffee. Jo says Sam ate $\frac{7}{16}$ of the toffee. Explain why Sam and Jo are both correct.</p>										
<p>Using the numbers 5 and 6 only once, make this sum have the smallest possible answer:</p> $\frac{\square}{15} + \frac{\square}{10} =$	<p>Using the numbers 3, 4, 5 and 6 only once, make this sum have the smallest possible answer:</p> $\frac{\square}{\square} + \frac{\square}{\square} =$										
<p>Graham is serving pizzas at a party. Each person is given $\frac{3}{4}$ of a pizza. Graham has six pizzas.</p> <p>How many people can he serve? Draw on the pizzas to show your thinking.</p>  <p>Write your answer as a multiplication sentence.</p>	<p>Graham is serving pizzas at a party. Each person is given $\frac{3}{4}$ of a pizza.</p> <p>Fill in the table below to show how many pizzas he must buy for each number of guests.</p> <table border="1"> <thead> <tr> <th>Guests</th> <th>Pizzas</th> </tr> </thead> <tbody> <tr> <td>4</td> <td></td> </tr> <tr> <td>6</td> <td></td> </tr> <tr> <td>8</td> <td></td> </tr> <tr> <td>10</td> <td></td> </tr> </tbody> </table> <p>When will he have pizza left over?</p>	Guests	Pizzas	4		6		8		10	
Guests	Pizzas										
4											
6											
8											
10											

Mastery	Mastery with Greater Depth
<p>Krysia wanted to buy a coat that cost £80. She saw the coat on sale in one shop at $\frac{1}{5}$ off. She saw the same coat on sale in another shop at 25% off.</p> <p>Which shop has the coat at a cheaper price?</p> <p>Explain your reasoning.</p>	<p>Jack and Jill each go out shopping. Jack spends $\frac{1}{4}$ of his money. Jill spends 20% of her money.</p> <p>Frank says Jack spent more because $\frac{1}{4}$ is greater than 20%. Alice says you cannot tell who spent more.</p> <p>Who do you agree with, Frank or Alice? Explain why.</p>
<p>Express the yellow section of the grid in hundredths, tenths, as a decimal and as a percentage of the whole grid. Do the same for the red section.</p> 	<p>Suggest another way to colour the grid to show clearly each fraction that is shaded. What fraction of the grid is shaded in total? How many different ways can you express the fraction of the grid that is shaded?</p> 

Year 6: Assessment of Mastery and Mastery with Greater Depth

Teaching for Mastery: Questions, tasks and activities to support assessment

Fractions and Decimals

Selected National Curriculum Programme of Study Statements

Pupils should be taught to:

- use factors to simplify fractions; use common multiples to express fractions in the same denominator
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
- multiply 1-digit numbers with up to two decimal places by whole numbers
- and use equivalences between simple fractions, decimals and percentages, including in different contexts

The Big Ideas

Fractions express a relationship between a whole and equal parts of a whole. Pupils should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question 'What fraction of the journey has Tom travelled?' the pupil might respond, 'Tom has travelled two thirds of the whole journey.'

Equivalent fractions are connected to the idea of ratio: keeping the numerator and denominator of a fraction in the same proportion creates an equivalent fraction. Putting fractions in place on the number lines helps understand fractions as numbers in their own right.

Mastery Check

Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined, but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?'; 'What happens if ...?'; and checking that pupils can use the procedures or skills to solve a variety of problems.

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Teaching for Mastery: Questions, tasks and activities to support assessment

Mastery

Only a fraction of each whole rod is shown. Using the given information, identify which whole rod is longer.



Explain your reasoning.

In each number sentence, replace the boxes with different whole numbers less than 20 so that the number sentence is true:

$$\frac{1}{\square} = \frac{3}{\square}$$

$$\frac{\square}{3} = \frac{\square}{12}$$

$$\frac{\square}{\square} = \frac{\square}{\square}$$

$$\frac{\square}{\square} = \frac{\square}{\square}$$

$$\square \div \square = \square \cdot \square$$

$$\frac{30}{\square} = \frac{45}{\square}$$

Mastery with Greater Depth

Only a fraction of each whole rod is shown. Using the given information, identify which whole rod is longer



Explain your reasoning.

Which is the odd one out?

$$\frac{2}{5}, 0.4, \frac{4}{10}, \frac{3}{6}, \frac{6}{15}$$

Explain your choice.

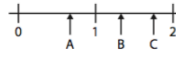
Put the following numbers into groups:

$$\frac{3}{4}, \frac{3}{2}, 0.5, 1.25, \frac{3}{8}, 0.125$$

Explain your choices.

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Mastery	Mastery with Greater Depth
Put the following numbers on a number line: $\frac{3}{4}$, $\frac{3}{2}$, 0.5, 1.25, $3 \div 8$, 0.125	Suggest a fraction that could be at point A, a decimal that could be at point B and an improper fraction that could be at point C on this number line. 
On Monday I ran $1\frac{2}{3}$ km and on Tuesday I ran $2\frac{2}{5}$ km. How far did I run altogether on these two days? On Wednesday I ran $1\frac{2}{3}$ km and my sister ran $2\frac{2}{3}$ km. How much further did my sister run than I did?	Altogether on Monday and Tuesday I ran $3\frac{1}{2}$ km. On neither day did I run a whole number of km. Suggest how far I ran on Monday and how far on Tuesday. On Wednesday I ran some km and my sister ran $1\frac{1}{6}$ km further than I did. Altogether we ran $4\frac{1}{2}$ km. How far did I run on Wednesday?

Mastery	Mastery with Greater Depth
Sam added two fractions together and got $\frac{7}{8}$ as the answer. Write down two fractions that Sam could have added. Tom wrote down two fractions. He subtracted the smaller fraction from the larger and got $\frac{1}{5}$ as the answer. Write down two fractions that Tom could have subtracted. Tom and Sam shared equally one third of a chocolate bar. What fraction of the chocolate bar did each child get?	Roland cuts a sandwich into two pieces. First, Roland gives one piece to Ayat and the other piece to Claire. Then Claire gives Ayat half of her piece. Now Ayat has $\frac{7}{8}$ of the original sandwich. Did Roland cut the sandwich into two equal pieces? If not, how did he cut the sandwich?
Last month Kira saved $\frac{3}{5}$ of her £10 pocket money. She also saved 15% of her £20 birthday money. How much did she save altogether?	Jakob says to Peter, 'Last month I saved 0.5 of my pocket money and this month I saved $\frac{1}{3}$ of my pocket money, so altogether I've saved 40% of my pocket money'. Do you think Peter should agree with Jakob? Explain your decision.
What's the same, and what's different about these number statements? <div style="border: 1px solid black; padding: 5px; width: fit-content;">Double one third of 15 One third of 30 2×5 $15 \times 2 \div 3$ $15 \div 3 \times 2$ $15 \times \frac{2}{3}$</div>	Amira says, 'To work out a fraction of a number, you multiply the number by the numerator of the fraction and then divide the answer by the denominator of the fraction'. Do you think that this is always, sometimes or never true? Explain your reasoning.

Mastery	Mastery with Greater Depth
<p>In each number sentence, replace the boxes with different whole numbers less than 20 so that the number sentence is true.</p> $\frac{1}{\square} \times \frac{3}{\square} = \frac{\square}{\square}$ $\frac{\square}{\square} \times \frac{\square}{\square} = \frac{8}{15}$ $\frac{2}{\square} \times \frac{5}{\square} < \frac{10}{\square}$ $\frac{\square}{\square} \div 3 = \frac{1}{\square}$ $\frac{\square}{\square} \div 3 > \frac{1}{4}$	<p>True or false?</p> <ul style="list-style-type: none"> The sum of two fractions is always greater than their product. If I divide a fraction by a whole number, the quotient is always smaller than the dividend. <p>Explain your reasoning.</p>
<p>Curtis used $\frac{1}{3}$ of a can of paint to cover 3.5 square metres of wall. How much wall will one whole can of paint cover?</p>	<p>Puja shares 6 apples between some friends. Each friend gets 0.75 of an apple. How many friends does she share the apples with?</p>

Our iPad and iPhone resources

Search for Jamtec on the AppStore. We also have other non-mathematics apps. Prices correct at 6 October 2015.



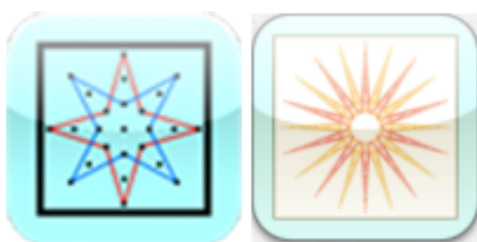
[Age-ulator](#) Free: [Randomised](#) £0.79



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[Maths Charts for Jenny Eather](#) Free:
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[Grids4Maths](#) £0.79: [GeoDraw](#) £0.79 (iPad only)

Education APPs from Apple

[Half price for volume purchase of some Education APPs](#)

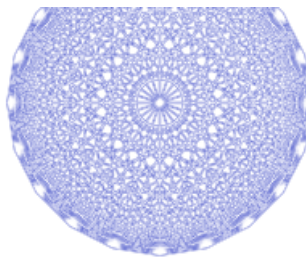
Maths APPs for iPads and iPhones



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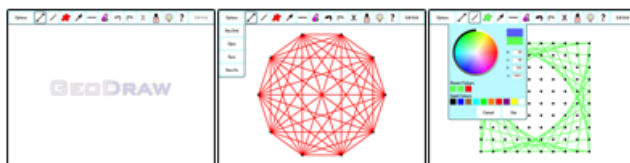


Grids

Circular
Isometric:
horizontal
Isometric: vertical
Polar
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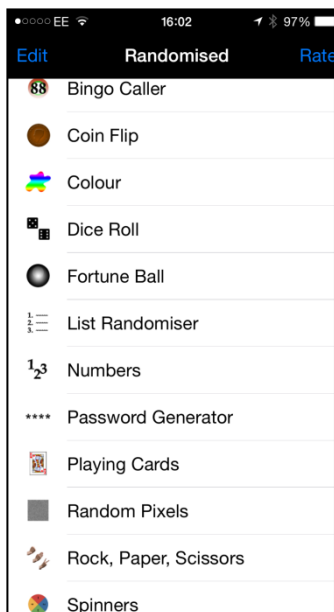
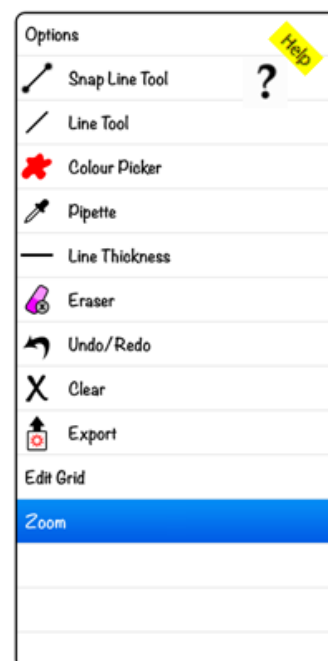
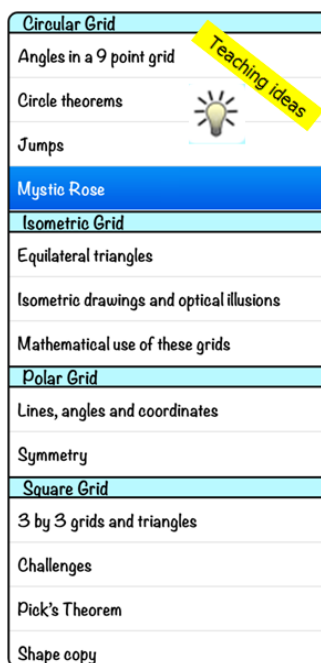


Change

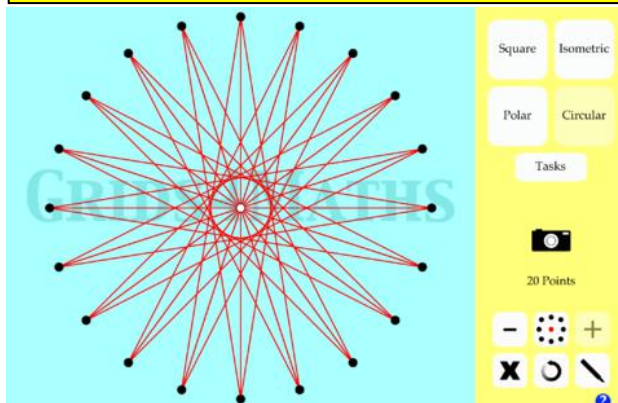
Number of grid points
Grid point size
Line thickness
Line colour

- GeoDraw offers users a choice of 5 grids for use in mathematics and D&T lessons. Send/export images with/without grid using: Bluetooth, Email, Facebook, Twitter and into Pages or Keynote.

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Randomised (79p): for probability lessons.
Age-ulator (free): for large number work and problem solving.
Grids4Maths (79p): much simpler version of GeoDraw for iPhones.



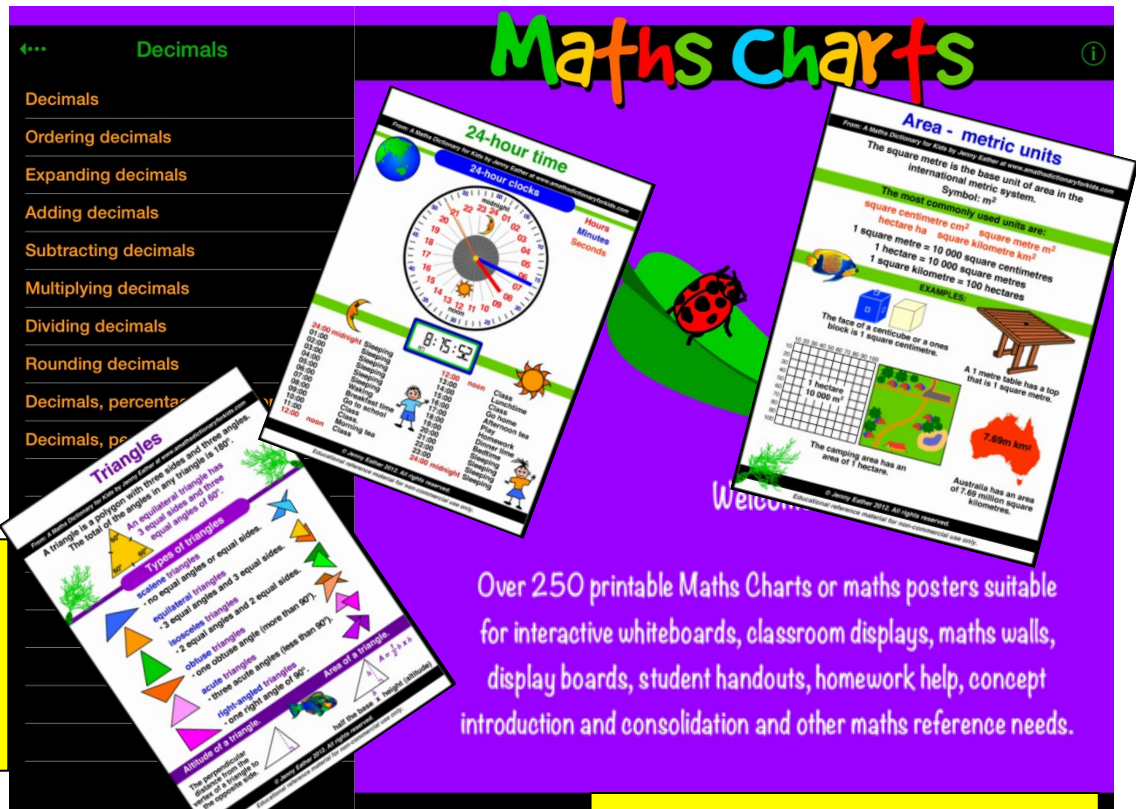
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$\frac{3}{8}$	$\frac{4}{5}$	$\frac{5}{8}$	$\frac{16}{36}$	$\frac{24}{30}$	$\frac{35}{63}$
$\frac{1}{9}$	$\frac{4}{9}$	$\frac{5}{9}$	$\frac{27}{36}$	$\frac{8}{72}$	$\frac{21}{56}$
$\frac{3}{5}$	$\frac{1}{7}$	$\frac{3}{4}$	$\frac{40}{64}$	$\frac{3}{21}$	$\frac{24}{40}$

Maths Pairs (£1.49) – three App bundle: eligible for VPP discount Directed Number, Equivalent and Multiplication Pairs (or 79p each).

7	x	1	=	Show
7	x	2	=	Show
7	x	3	=	Show
7	x	4	=	Show
7	x	5	=	Show
7	x	6	=	Show
7	x	7	=	Show
7	x	8	=	Show
7	x	9	=	Show
7	x	10	=	Show
7	x	11	=	Show
7	x	12	=	Show



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$64 \div 8$	$72 \div 12$	$48 \div 8$	9	6	5
$40 \div 8$	$70 \div 7$	$20 \div 4$	10	9	5
$72 \div 8$	$21 \div 3$	$81 \div 9$	8	6	7