

Lea Community Primary School



Progression in Calculations



Academic Year 2025-2026

Declarative Knowledge

	Additive structures	Multiplicative structures	Fractions
EYFS	Number bonds to 5		
Year One	Addition and subtraction within 10.		Half and one quarter of a quantity
Year Two	As above and: Addition and subtraction across 10.	Doubles and halves	As above and: 3 quarters of a quantity
Year Three	As above and : Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.	As above and: Recall the 10 and 5 multiplication tables, and corresponding division facts. Recall the 2, 4 and 8 multiplication tables, and corresponding division facts	As above and: One third and two thirds of a quantity One fifth, two fifths, three fifths, four fifths of a quantity
Year Four	Conditional knowledge: Applying the above to problem solving and reasoning.	As above and: Recall the 3, 6 and 9 multiplication tables, and corresponding division facts. Recall the 7 multiplication table, and corresponding division facts Recall the 11 and 12 multiplication tables, and corresponding division facts.	As above and: Equivalent fractions
Year 5		Secure and maintain fluency in all multiplication tables, and	As above and: Fraction, decimal and percentage

Progression in Calculations

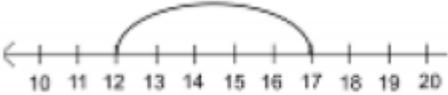
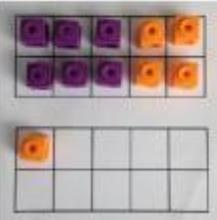
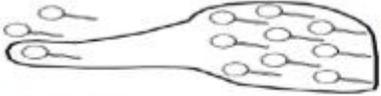
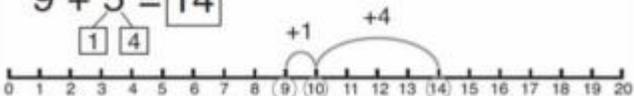
		corresponding division facts, through continued practice.	correspondence.
Year 6		Conditional knowledge: Applying the above to problem solving and reasoning.	Conditional knowledge: Applying the above to problem solving and reasoning.

Procedural Knowledge

Addition

Objective and strategies	Concrete	Pictorial	Abstract
Find one more			One more than 6 is ____ 6 and one more is ____
Combining two parts to make a whole: part whole model	<p>Use cubes to add two numbers together as a group or in a bar.</p>	<p>Use pictures to add two numbers together as a group or in a bar.</p>	$4 + 3 = 7$ $10 = 6 + 4$ <p>Use the part-part whole diagram as shown above to move into the abstract.</p>

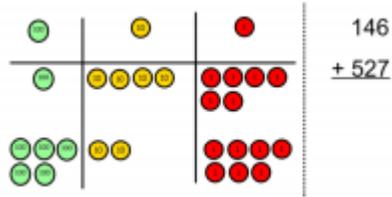
Progression in Calculations

<p>Starting at the bigger number and counting on</p>	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	<p>$12 + 5 = 17$</p>  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	<p>$5 + 12 = 17$</p> <p>Place the larger number in your head and count on the smaller number to find your answer.</p>
<p>Regrouping to make 10.</p>	 <p>$6 + 5 = 11$</p>  <p>Start with the bigger number and use the smaller number to make 10.</p>	 <p>$3 + 9 =$</p> <p>Use pictures or a number line. Regroup or partition the smaller number to make 10.</p> <p>$9 + 5 = 14$</p> 	<p>$7 + 4 = 11$</p> <p>If I am at seven, how many more do I need to make 10. How many more do I add on now?</p>

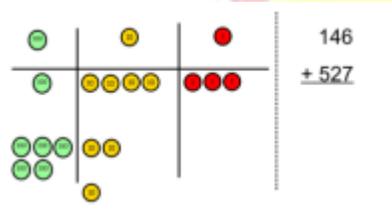
Progression in Calculations

Column method regrouping

Make both numbers on a place value grid.

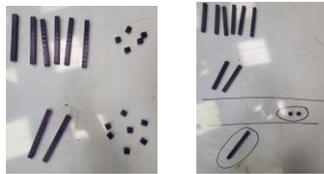


Add up the units and exchange 10 ones for one 10

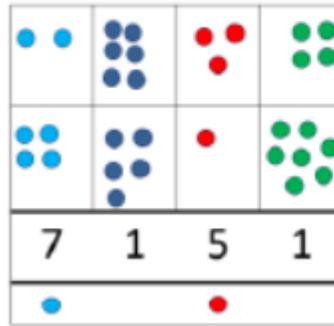


Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added. This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100.

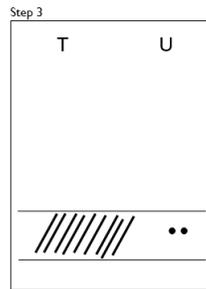
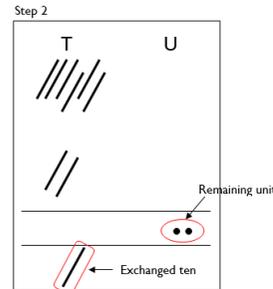
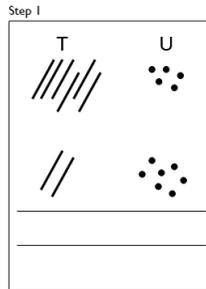
As children move on to decimals, money and decimal place value counters can be used to support learning.



Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.



e.g. 65 + 27



Start by partitioning the numbers before moving on to clearly show the exchange below the addition.

$$\begin{array}{r} 20 + 5 \\ 40 + 8 \\ 60 + 13 = 73 \end{array} \quad \begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$$

As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.

$$\begin{array}{r} 72.8 \\ + 54.6 \\ \hline 127.4 \\ 11 \end{array} \quad \begin{array}{r} \pounds 23.59 \\ + \pounds 7.55 \\ \hline \pounds 31.14 \\ 11 \end{array}$$

$$\begin{array}{r} 23.361 \\ 9.080 \\ + 1.300 \\ \hline 93.511 \\ 212 \end{array}$$

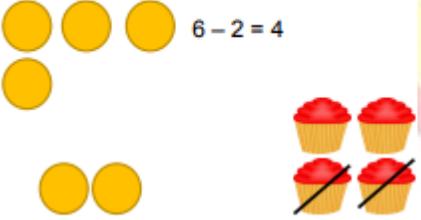
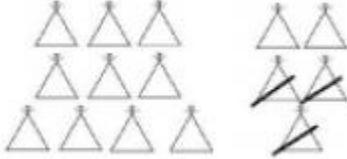
Written method

Step 1	Step 2	Step 3
$\begin{array}{r} T \quad U \\ 6 \quad 5 \\ + 2 \quad 7 \\ \hline \end{array}$	$\begin{array}{r} T \quad U \\ 6 \quad 5 \\ + 2 \quad 7 \\ \hline 2 \end{array}$	$\begin{array}{r} T \quad U \\ 6 \quad 5 \\ + 2 \quad 7 \\ \hline 9 \quad 2 \\ 1 \end{array}$

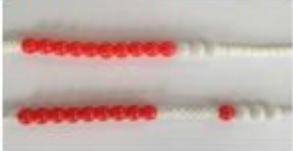
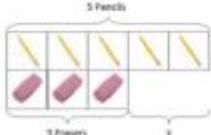
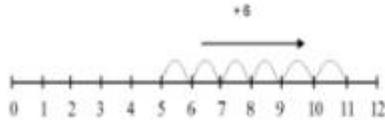
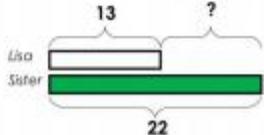
--	--	--	--



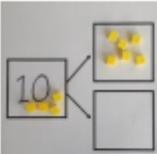
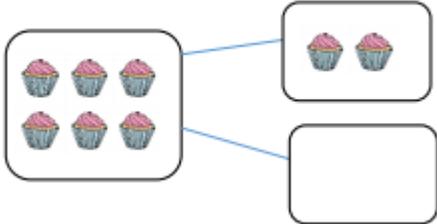
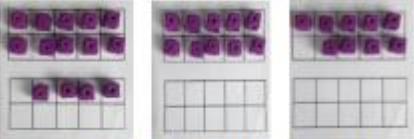
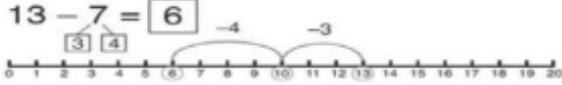
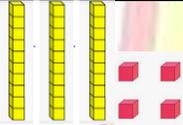
Subtraction

Objective and strategies	Concrete	Pictorial	Abstract
Find one less			One less than 6 is ____ ____ is one less than 6.
Taking away ones	Use physical objects, counters, cubes etc to show how objects can be taken away.  $6 - 2 = 4$	Cross out drawn objects to show what has been taken away.  $15 - 3 = \boxed{12}$	$18 - 3 = 15$ $8 - 2 = 6$

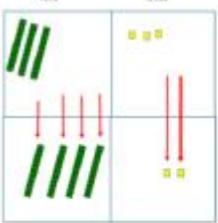
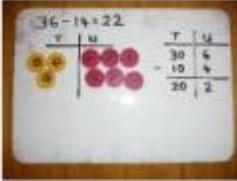
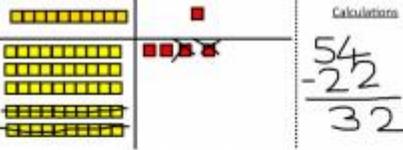
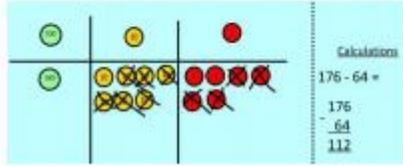
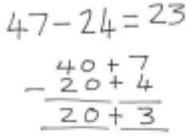
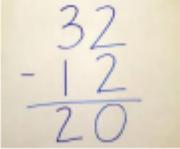
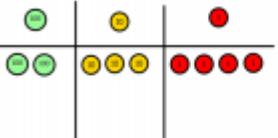
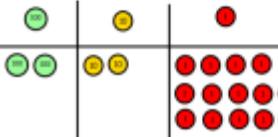
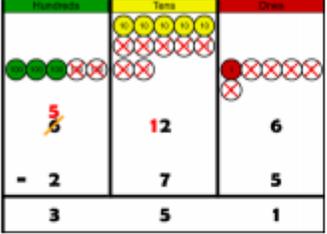
Progression in Calculations

<p>Counting back</p>	<p>Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.</p>  <p>13 - 4</p> <p>Use counters and move them away from the group as you take them away counting backwards as you go.</p> 	<p>Count back on a number line or number track</p>  <p>Start at the bigger number and count back the smaller number showing the jumps on the number line.</p>  <p>This can progress all the way to counting back using two 2 digit numbers.</p>	<p>Put 13 in your head, count back 4. What number are you at? Use your fingers to help.</p> <p>$13 - 4 = 9$</p>
<p>Find the difference</p>	<p>Compare amounts and objects to find the difference.</p>  <p>Use cubes to build towers or make bars to find the difference</p>  <p>Use basic bar models with items to find the difference</p>	<p>Count on to find the difference.</p>  <p>Comparison Bar Models</p> <p>Draw bars to find the difference between 2 numbers.</p> <p>Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.</p> 	<p>Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.</p> <p>$23 - 15 = 8$</p>

Progression in Calculations

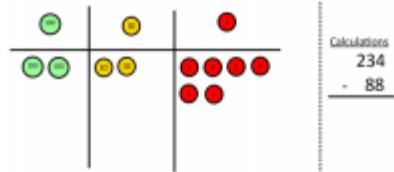
<p>Part Part Whole Model</p>	 <p>Link to addition- use the part whole model to help explain the inverse between addition and subtraction.</p> <p>If 10 is the whole and 6 is one of the parts. What is the other part?</p> <p>$10 - 6 =$</p>	<p>Use a pictorial representation of objects to show the part part whole model.</p> 	 <p>Move to using numbers within the part whole model.</p>
<p>Make 10 (regrouping)</p>	<p>$14 - 9 =$</p>  <p>Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.</p>	<p>$13 - 7 = 6$</p>  <p>Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.</p>	<p>$16 - 8 =$ How many do we take off to reach the next 10? How many do we have left to take off?</p>
<p>Subtract across a 10 (exchanging)</p>			<p>$34 - 5 =$</p>

Progression in Calculations

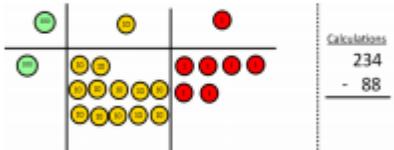
<p>Column method without regrouping</p>	<p>Use Base 10 to make the bigger number then take the smaller number away.</p>  <p>Show how you partition numbers to subtract. Again make the larger number first.</p> 	 <p>Draw the Base 10 or place value counters alongside the written calculation to help to show working.</p> 	<p>$47 - 24 = 23$</p>  <p>This will lead to a clear written column subtraction.</p> 
<p>Column method with regrouping</p>	<p>Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges.</p> <p>Make the larger number with the place value counters</p>  <p>Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.</p> 	 <p>Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.</p>  <p>When confident, children can find their own way to record the exchange/regrouping.</p> <p>Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.</p>	 <p>Children can start their formal written method by partitioning the number into clear place value columns.</p>  <p>Moving forward the children use a more compact method.</p> <p>This will lead to an understanding of subtracting any number including decimals.</p>

Progression in Calculations

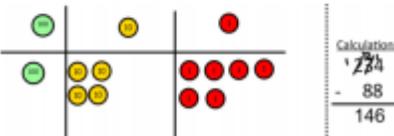
Now I can subtract my ones.



Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.



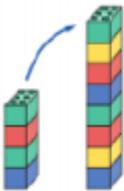
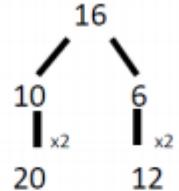
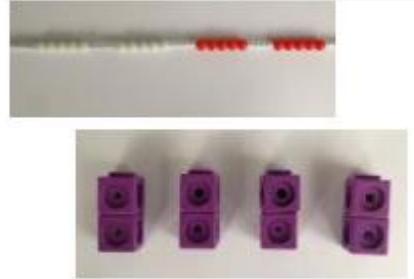
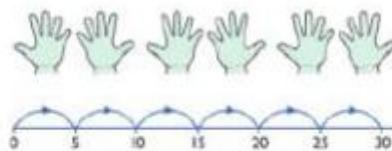
Now I can take away eight tens and complete my subtraction



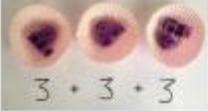
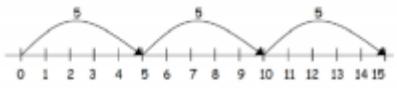
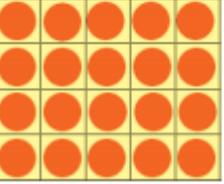
Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.

$$\begin{array}{r} 5 \quad 12 \quad 1 \\ 2 \quad \cancel{6} \quad \cancel{3} \quad . \quad 0 \\ - \quad 2 \quad 6 \quad . \quad 5 \\ \hline 2 \quad 3 \quad 6 \quad . \quad 5 \end{array}$$

Multiplication

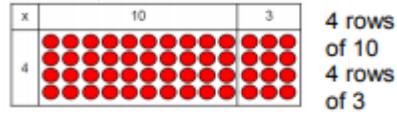
Objective and strategies	Concrete	Pictorial	Abstract																																																																																																				
<p>Doubling</p>	<p>Use practical activities to show how to double a number.</p>  <p>double 4 is 8 $4 \times 2 = 8$</p>	<p>Draw pictures to show how to double a number.</p> <p>Double 4 is 8</p> 	 <p>Partition a number and then double each part before recombining it back together.</p>																																																																																																				
<p>Counting in multiples</p>	 <p>Count in multiples supported by concrete objects in equal groups.</p>	 <p>Use a number line or pictures to continue support in counting in multiples.</p> <table border="1" data-bbox="974 1013 1164 1197"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>
1	2	3	4	5	6	7	8	9	10																																																																																														
11	12	13	14	15	16	17	18	19	20																																																																																														
21	22	23	24	25	26	27	28	29	30																																																																																														
31	32	33	34	35	36	37	38	39	40																																																																																														
41	42	43	44	45	46	47	48	49	50																																																																																														
51	52	53	54	55	56	57	58	59	60																																																																																														
61	62	63	64	65	66	67	68	69	70																																																																																														
71	72	73	74	75	76	77	78	79	80																																																																																														
81	82	83	84	85	86	87	88	89	90																																																																																														
91	92	93	94	95	96	97	98	99	100																																																																																														

Progression in Calculations

<p>Repeated addition</p>	 $3 + 3 + 3$   <p>Use different objects to add equal groups.</p>	<p>There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?</p>  <p>2 add 2 add 2 equals 6</p>  <p>5 + 5 + 5 = 15</p> <table border="1" data-bbox="981 515 1397 643"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	<p>Write addition sentences to describe objects and pictures.</p>  <p>2 + 2 + 2 + 2 + 2 = 10</p>
1	2	3	4	5	6	7	8	9	10																								
11	12	13	14	15	16	17	18	19	20																								
21	22	23	24	25	26	27	28	29	30																								
<p>Arrays showing commutative multiplication</p>	<p>Create arrays using counters/ cubes to show multiplication sentences. e.g. 4 rows of 6 = 24</p>  	<p>Draw arrays in different rotations to find commutative multiplication sentences.</p>  <p>4 × 2 = 8</p>  <p>2 × 4 = 8</p>  <p>2 × 4 = 8</p>  <p>4 × 2 = 8</p>  <p>Link arrays to area of rectangles.</p>	<p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p>5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 × 3 = 15 3 × 5 = 15</p>																														

Grid Method

Show the link with arrays to first introduce the grid method.



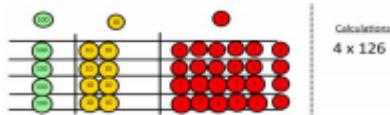
Move on to using Base 10 to move towards a more compact method.



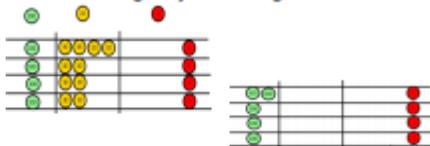
Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.



Fill each row with 126.

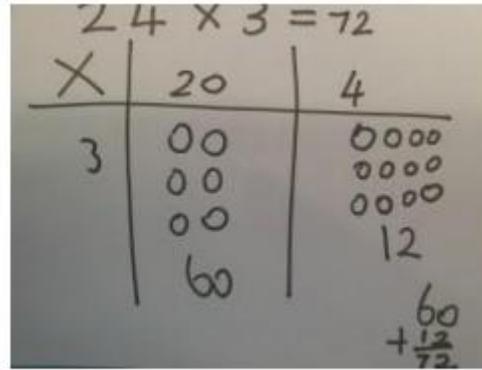


Add up each column, starting with the ones making any exchanges needed.



Then you have your answer.

Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.



Start with multiplying by one digit numbers and showing the clear addition alongside the grid.

x	30	5
7	210	35

$$210 + 35 = 245$$

Moving forward, multiply by a 2 digit number showing the different rows within the grid method.

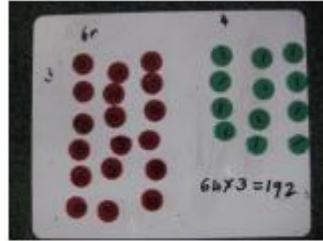
	10	8
10	100	80
3	30	24

x	1000	300	40	2
10	10000	3000	400	20
8	8000	2400	320	16

Progression in Calculations

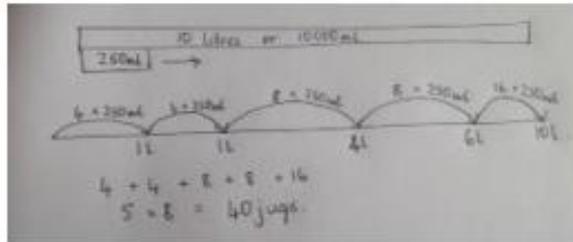
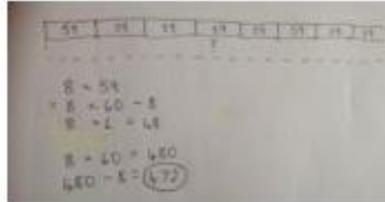
Column multiplication

Children can continue to be supported by place value counters at the stage of multiplication.



It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.



Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

If it helps, children can write out what they are solving next to their answer.

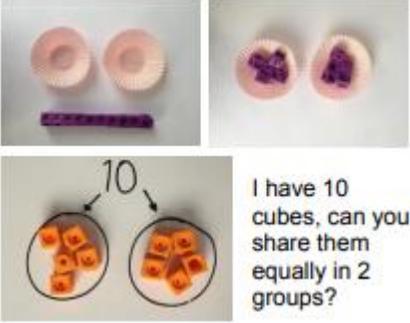
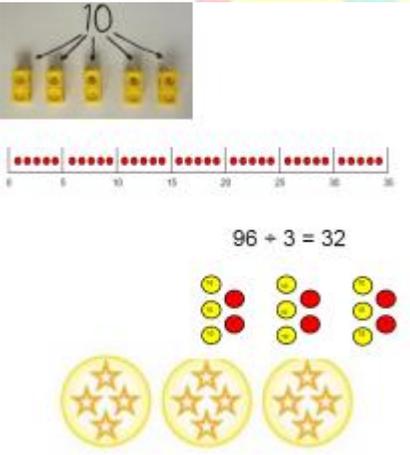
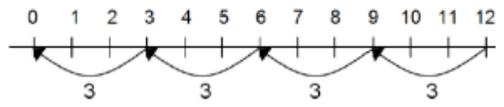
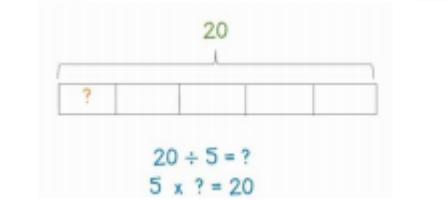
$$\begin{array}{r} 32 \\ \times 24 \\ \hline 8 \quad (4 \times 2) \\ 120 \quad (4 \times 30) \\ 600 \quad (20 \times 30) \\ \hline 768 \end{array}$$

$$\begin{array}{r} 74 \\ \times 63 \\ \hline 12 \\ 210 \\ 240 \\ + 4200 \\ \hline 4662 \end{array}$$

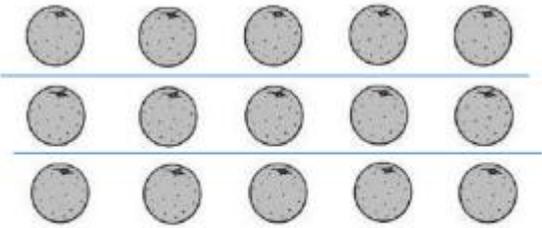
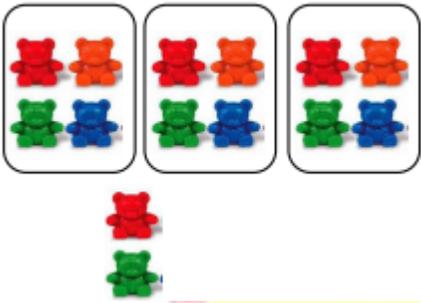
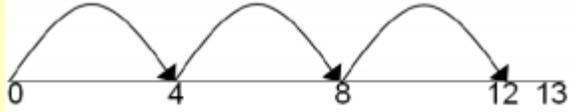
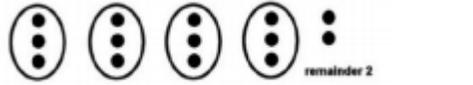
This moves to the more compact method.

$$\begin{array}{r} \text{TTh Th H T U} \\ 693 \\ \times 24 \\ \hline 2772 \quad (693 \times 4) \\ + 13860 \quad (693 \times 20) \\ \hline 16632 \end{array}$$

Division

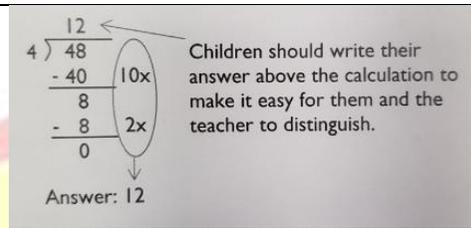
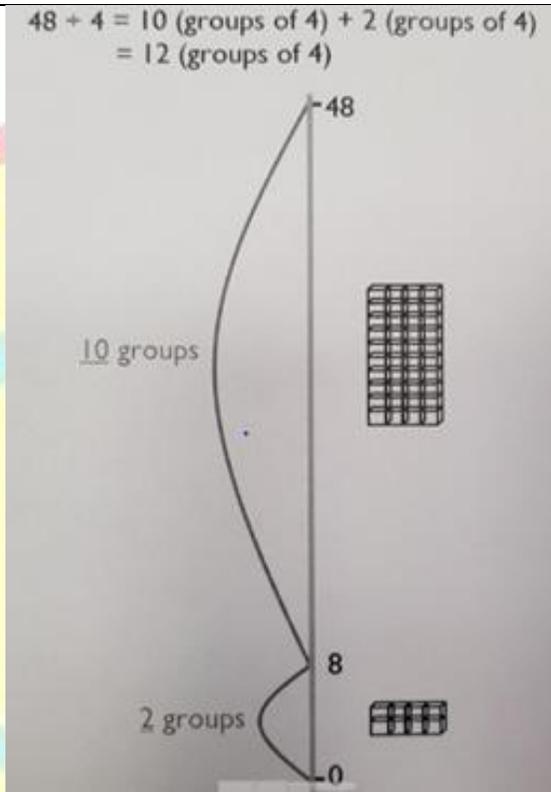
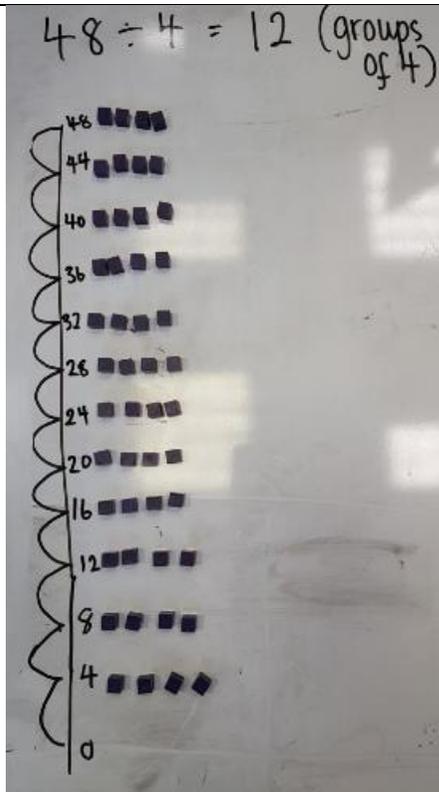
Objective and strategies	Concrete	Pictorial	Abstract	
Sharing objects into equal groups	 <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p> 	Share 9 buns between three people.	$9 \div 3 =$
Division as grouping	<p>Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>$96 \div 3 = 32$</p>	<p>Use a number line to show jumps in groups. The number of jumps equals the number of groups.</p>  <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>  <p>$20 \div 5 = ?$ $5 \times ? = 20$</p>	<p>$28 \div 7 = 4$</p> <p>Divide 28 into 7 groups. How many are in each group?</p>	

Progression in Calculations

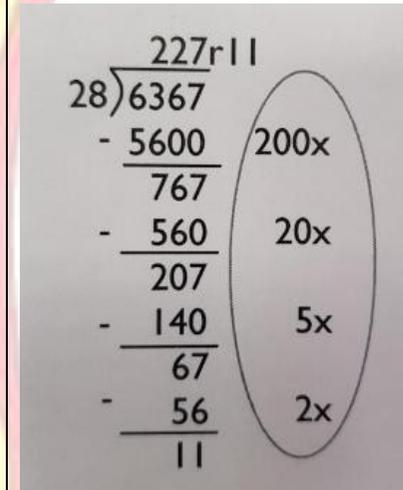
<p>Division within arrays</p>	 <p>Link division to multiplication by creating an array and thinking about the number sentences that can be created.</p> <p>Eg $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$</p>	 <p>Draw an array and use lines to split the array into groups to make multiplication and division sentences.</p>	<p>Find the inverse of multiplication and division sentences by creating four linking number sentences.</p> <p>$7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$</p>
<p>Division with a remainder</p>	<p>$14 \div 3 =$ Divide objects between groups and see how much is left over</p> 	<p>Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.</p>  <p>Draw dots and group them to divide an amount and clearly show a remainder.</p> 	<p>Complete written divisions and show the remainder using r.</p> <p>$29 \div 8 = 3 \text{ REMAINDER } 5$</p> <p>↑ ↑ ↑ ↑ dividend divisor quotient remainder</p>

Progression in Calculations

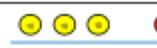
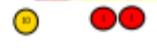
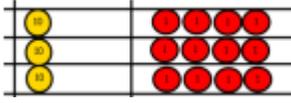
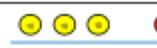
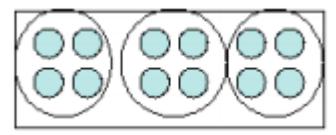
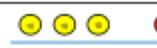
Division by Subtraction (Chunking)



Progressing to:



If children have full conceptual understanding and are proficient with chunking method, they may be taught short (bus stop) and long division.

<p>Short division</p>	<div style="text-align: center;"> <table border="1" style="margin: auto;"> <thead> <tr> <th style="width: 20px;"></th> <th style="width: 40px;">Tens</th> <th style="width: 40px;">Units</th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: right; padding-right: 10px;">3</td> <td style="text-align: center;">    </td> <td style="text-align: center;">    </td> </tr> </tbody> </table> <p>Use place value counters to divide using the bus stop method alongside</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="border: 1px solid black; padding: 5px; text-align: center;"> Calculations $42 \div 3$ </div> </div> <div style="margin-top: 10px;"> <table border="1" style="width: 100%; height: 40px; border-collapse: collapse;"> <tr><td style="width: 33%;"></td><td style="width: 33%;"></td><td style="width: 33%;"></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table> </div> <p>$42 \div 3 =$</p> <p>Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.</p> <div style="text-align: center; margin-top: 10px;">  </div> <div style="margin-top: 10px;"> <table border="1" style="width: 100%; height: 40px; border-collapse: collapse;"> <tr><td style="width: 33%;"></td><td style="width: 33%;"></td><td style="width: 33%;"></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table> </div> <p>We exchange this ten for ten ones and then share the ones equally among the groups.</p> <div style="text-align: center; margin-top: 10px;">  </div> <p>We look how much in 1 group so the answer is 14.</p> </div>		Tens	Units		3	2	3	  	  																									<p>Children can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>Encourage them to move towards counting in multiples to divide more efficiently</p>	<p>Begin with divisions that divide equally with no remainder</p> <div style="text-align: center; margin: 10px 0;"> $\begin{array}{r} 218 \\ 3 \overline{) 872} \end{array}$ </div> <p>Move onto divisions with a remainder.</p> <div style="text-align: center; margin: 10px 0;"> $\begin{array}{r} 86 \text{ r } 2 \\ 3 \overline{) 432} \end{array}$ </div> <p>Finally move into decimal places to divide the total accurately.</p> <div style="text-align: center; margin: 10px 0;"> $\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \end{array}$ </div>
	Tens	Units																																		
	3	2																																		
3	  	  																																		

Progression in Calculations

Long division



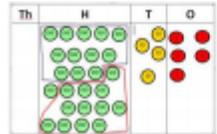
2544 ÷ 12
How many groups of 12 thousands do we have?
None

Exchange 2 thousand for 20 hundreds.



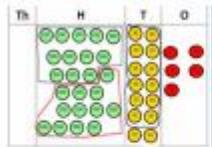
$$12 \overline{) 2544}$$

How many groups of 12 are in 25 hundreds? 2 groups. Circle them. We have grouped 24 hundreds so can take them off and we are left with one.



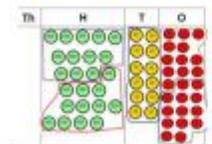
$$12 \overline{) 2544} \\ \underline{24} \\ 1$$

Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2



$$12 \overline{) 2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 2$$

Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2



$$12 \overline{) 2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 24 \\ \underline{24} \\ 0$$

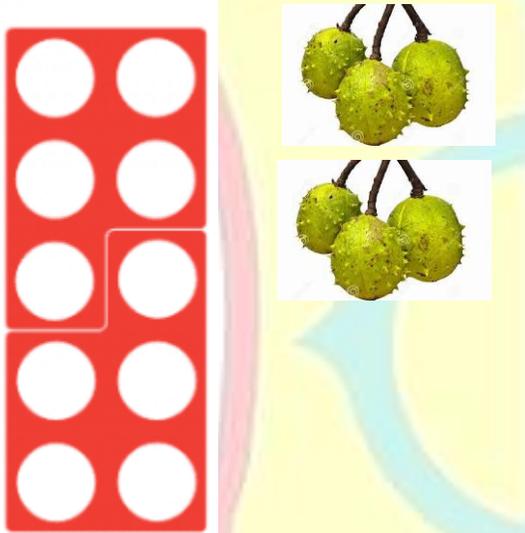
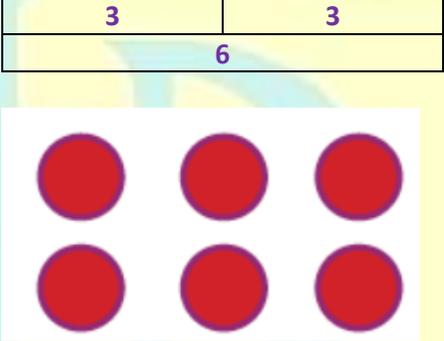
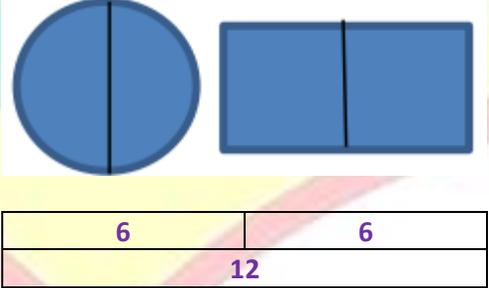
Instead of using physical counters, children can draw the counters and circle the groups on a whiteboard or in their books.

Use this method to explain what is happening and as soon as they have understood what move on to the abstract method as this can be a time consuming process.

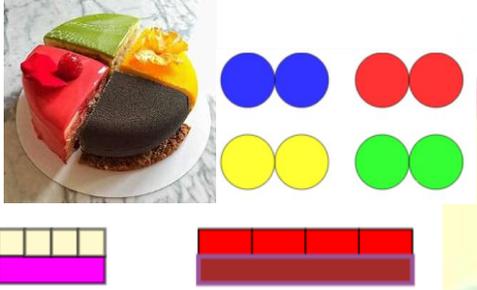
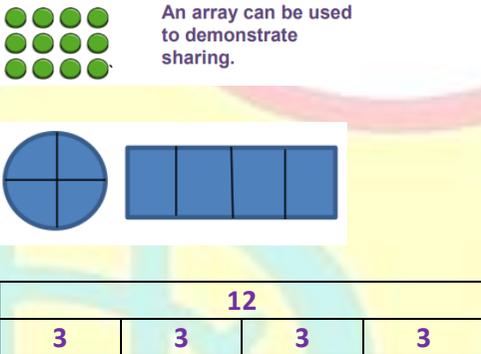
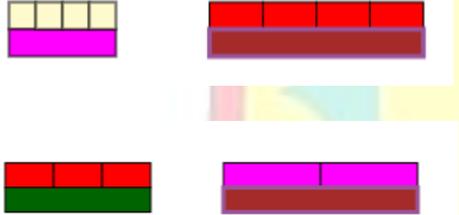
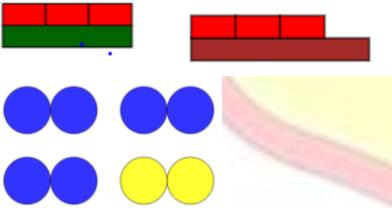
$$\begin{array}{r}
 0318 \text{ r}5 \\
 20 \overline{) 6365} \\
 \underline{-60} \\
 36 \\
 \underline{-36} \\
 20 \\
 \underline{-20} \\
 165 \\
 \underline{-160} \\
 5
 \end{array}$$

Progression in Calculations

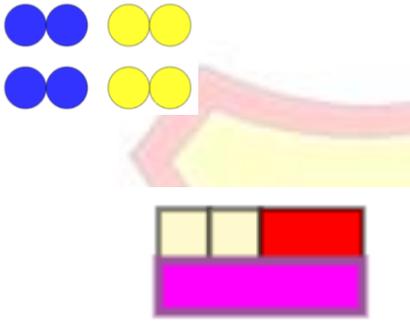
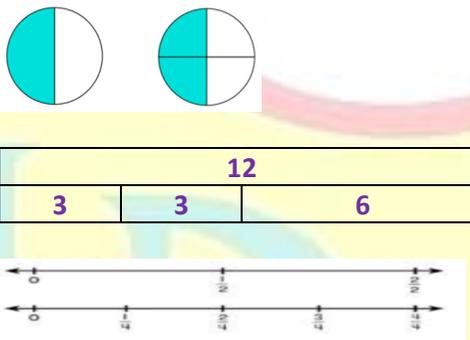
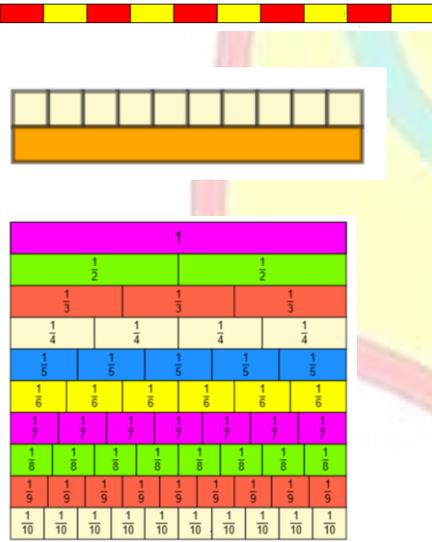
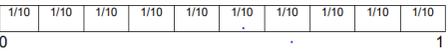
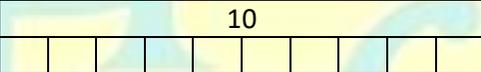
Fractions

Objective/strategy	Concrete	Pictorial	Abstract
<p>Composition of number: Children will be able to see some numbers can be made of two equal parts.</p>			<p>Adults to use fraction vocabulary of halves and quarters accurately</p>
<p>Recognise, find and name a half as one of two equal parts of an object, shape or quantity</p>			<p>$\frac{1}{2}$ of 12 =</p> <p>Hamish has 14 bananas. He gives away half. How many does he give away?</p>

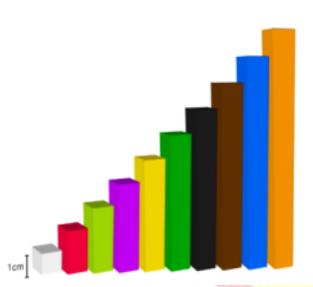
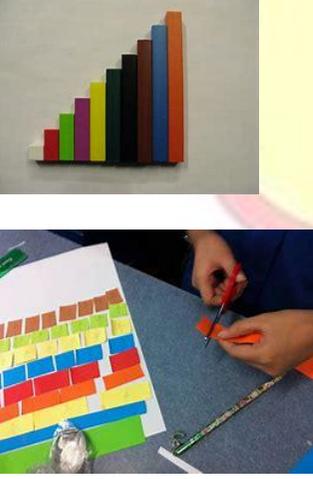
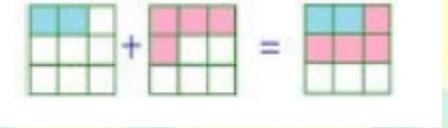
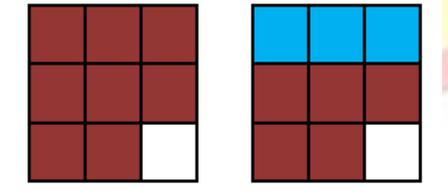
Progression in Calculations

<p>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity</p> <p>Begin to learn sharing and grouping into equal parts.</p>		 <p>An array can be used to demonstrate sharing.</p> <table border="1" data-bbox="1019 534 1500 606"> <tr><td colspan="4">12</td></tr> <tr><td>3</td><td>3</td><td>3</td><td>3</td></tr> </table>	12				3	3	3	3	<p>$\frac{1}{4}$ of 20=</p> <p>Hannah has 20 strawberries. She splits them into quarters. What is a quarter of 20?</p>						
12																	
3	3	3	3														
<p>Begin to recognise that the larger the denominator the smaller the fraction (unit fractions or same numerator).</p>		<table border="1" data-bbox="1019 678 1500 750"> <tr><td>4</td><td>4</td><td>4</td></tr> <tr><td colspan="3">12</td></tr> </table> <table border="1" data-bbox="1019 790 1500 861"> <tr><td colspan="4">12</td></tr> <tr><td>3</td><td>3</td><td>3</td><td>3</td></tr> </table>	4	4	4	12			12				3	3	3	3	<p>$\frac{1}{3}$ of 12=4</p> <p>$\frac{1}{4}$ of 12=3</p>
4	4	4															
12																	
12																	
3	3	3	3														
<p>Recognise, find, name and write fractions $\frac{1}{3}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity</p>		<table border="1" data-bbox="1019 933 1500 1005"> <tr><td colspan="3">15</td></tr> <tr><td>5</td><td>5</td><td>5</td></tr> </table> <table border="1" data-bbox="1019 1045 1500 1117"> <tr><td colspan="4">20</td></tr> <tr><td>5</td><td>5</td><td>5</td><td>5</td></tr> </table> <p>$\frac{1}{3}$ <input type="text"/></p> <p>$\frac{3}{4}$ <input type="text"/></p>	15			5	5	5	20				5	5	5	5	<p>$\frac{1}{3}$ of 15=5</p> <p>$\frac{3}{4}$ of 12=9</p> <p>Ahmed has 15 cards. He gives away $\frac{1}{3}$. How many does he give away?</p>
15																	
5	5	5															
20																	
5	5	5	5														

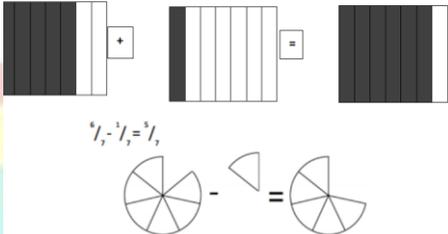
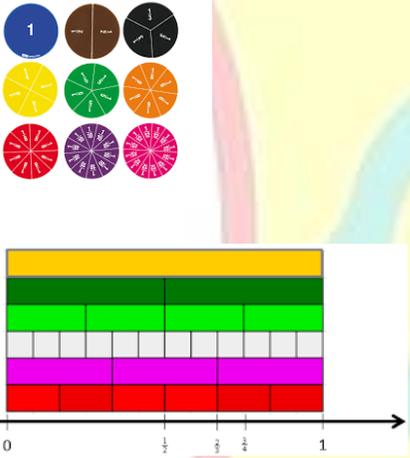
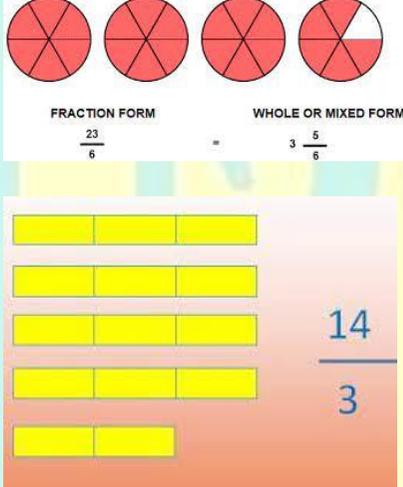
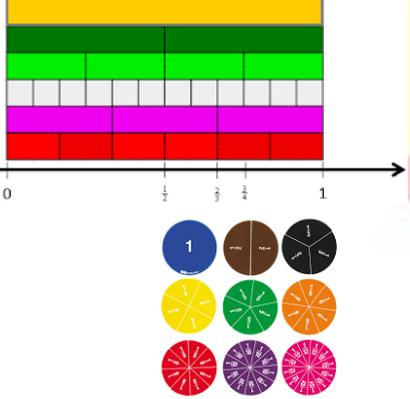
Progression in Calculations

<p>Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.</p>			<p>Children need to relate finding a quarter to halving and halving again.</p> <p>They relate this to find fractions of a length e.g. $\frac{2}{4}$ of 1m =</p> <p>$\frac{1}{2}$ of 20 =</p> <p>$\frac{2}{4}$ of 20 =</p>
<p>Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one digit numbers or quantities by 10</p>		<p>$1 \div 10 = 1/10$</p>   	<p>$\frac{3}{10} + \frac{1}{10} =$</p>

Progression in Calculations

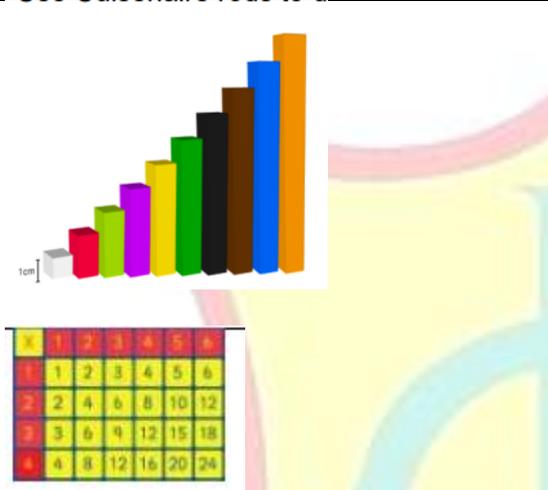
<p>Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</p>		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="8" style="text-align: center;">16</td> </tr> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px; text-align: center;">2</td> </tr> </table>	16															2	<p>$\frac{1}{8}$ of 16</p> <p>$\frac{2}{8}$ of 16</p>
16																			
							2												
<p>Recognise and show, using diagrams, equivalent fractions with small denominators</p>			<p>$\frac{1}{2} = \frac{4}{8}$</p> <p>$= \frac{8}{8}$</p> <p>$\frac{1}{2} = \frac{6}{6}$</p>																
<p>Add and subtract fractions with the same denominator within one whole</p>		 	<p>$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$</p> <p>$\frac{2}{7} + \frac{1}{7} = \frac{3}{7}$</p> <p>$\frac{4}{5} - \frac{1}{5} = \frac{3}{5}$</p> <p>$\frac{4}{8} - \frac{1}{8} = \frac{3}{8}$</p>																

Progression in Calculations

		 <p>$\frac{1}{2} + \frac{1}{2} = 1$</p> <p>$\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$</p>	
<p>Recognise and write mixed number fractions- link to the addition of fractions with the same denominator</p>		 <p>FRACTION FORM: $\frac{23}{6}$</p> <p>WHOLE OR MIXED FORM: $3 \frac{5}{6}$</p> <p>$\frac{14}{3}$</p>	<p>$\frac{4}{5} + \frac{3}{5} =$</p> <p>$\frac{6}{7} + \frac{5}{7} =$</p>
<p>Compare and order unit fractions</p>		<p>Examples of Fraction Bar Modeling:</p> <p>Fraction Comparisons: $\frac{1}{3} < \frac{1}{2}$</p> <p>Equivalent Fractions: $\frac{2}{8} = \frac{1}{4}$</p>	<p>$\frac{4}{5} > \frac{1}{3}$</p> <p>$\frac{2}{8} < \frac{1}{2}$</p>

Progression in Calculations

Recognise and show using diagrams, families of common equivalent fractions

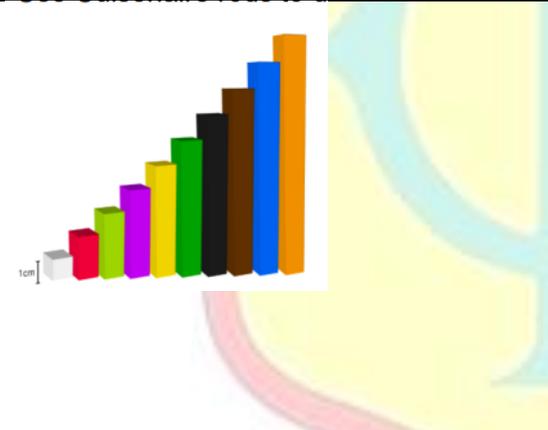


$$\frac{1}{5} = \frac{2}{10}$$

$$\frac{2}{3} = \frac{4}{6}$$

$$\frac{4}{8} = \frac{1}{2}$$

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



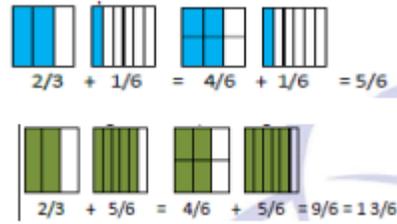
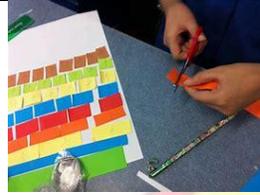
recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents

50			

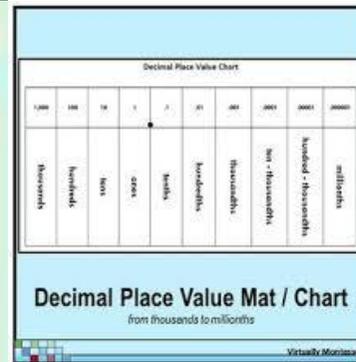
I have 50 strawberries. I eat $\frac{3}{5}$. How many do I eat? How many do I have left?

Progression in Calculations

Add and subtract fractions with the same denominator

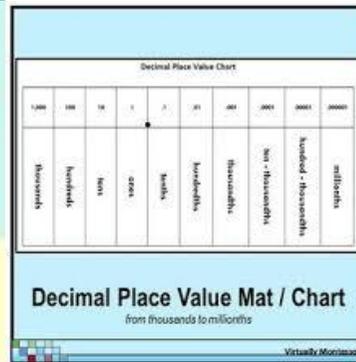
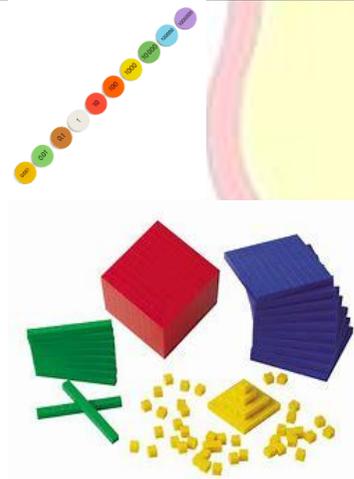


Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredth



45 ÷ 10
45 ÷ 100
67 ÷ 10
67 ÷ 100

Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents

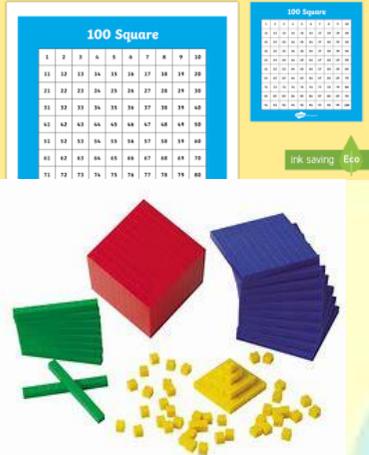
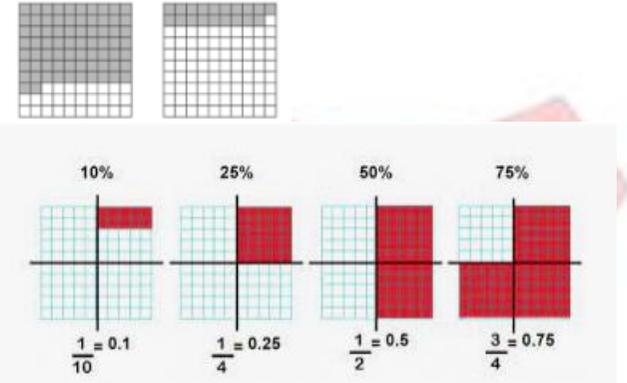
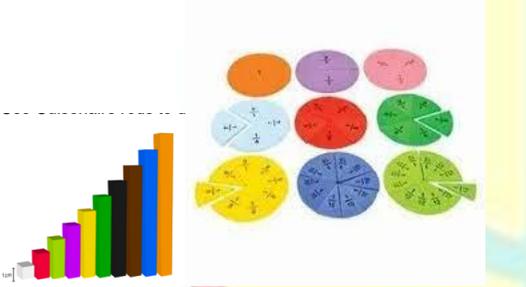
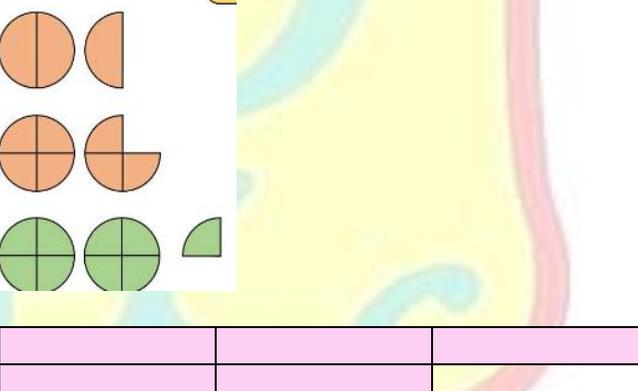


1/10 = 0.1

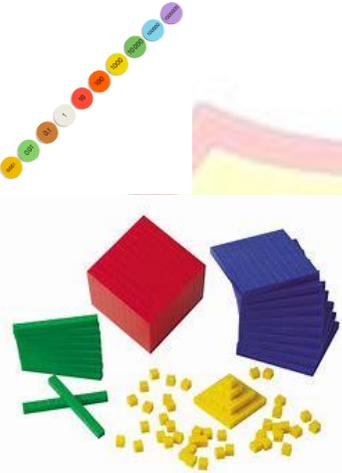
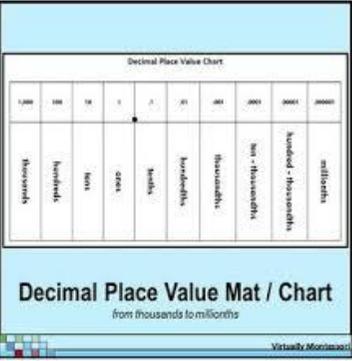
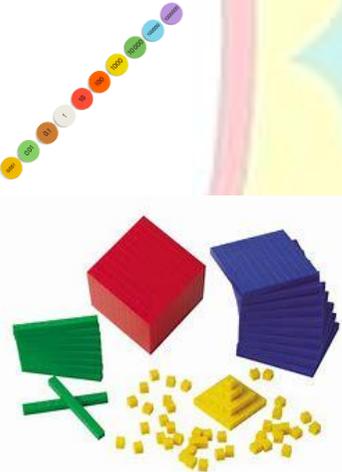
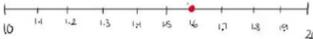
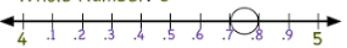
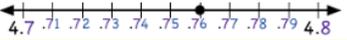
4/10 = 0.4

1/100 = 0.01

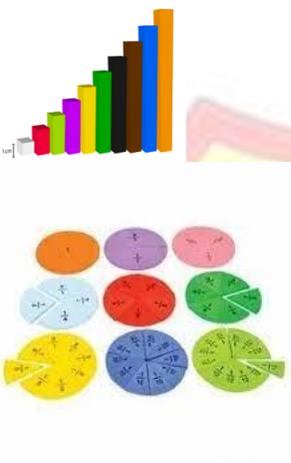
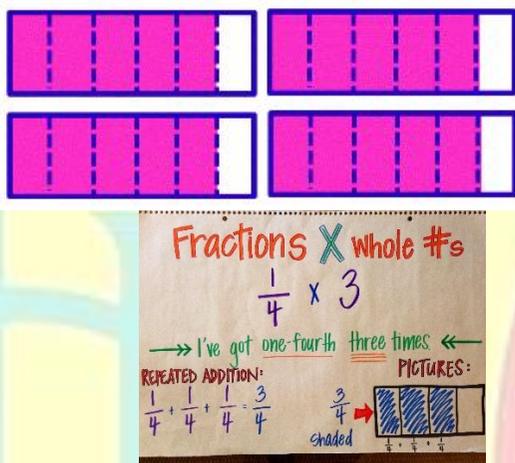
Progression in Calculations

<p>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 as a decimal fraction</p>	 <p>100 Square</p> <p>100 Square</p> <p>ink saving Eco</p>	 <p>10% 25% 50% 75%</p> <p>$\frac{1}{10} = 0.1$ $\frac{1}{4} = 0.25$ $\frac{1}{2} = 0.5$ $\frac{3}{4} = 0.75$</p>	<p>$0.65 = 65\%$ $0.1 = 10\%$ $20\% \text{ of } 70 =$</p>						
<p>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number</p>		 <table border="1" data-bbox="1019 1021 1657 1085"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>							<p>$1\frac{2}{3} = \frac{5}{3}$ $1\frac{3}{4} = \frac{7}{4}$</p>

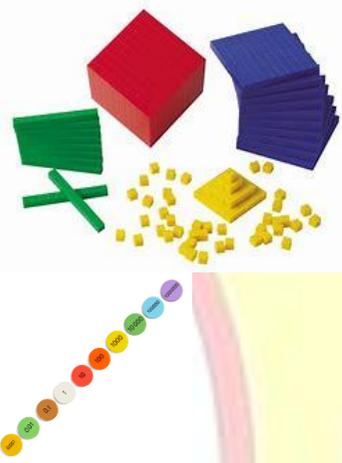
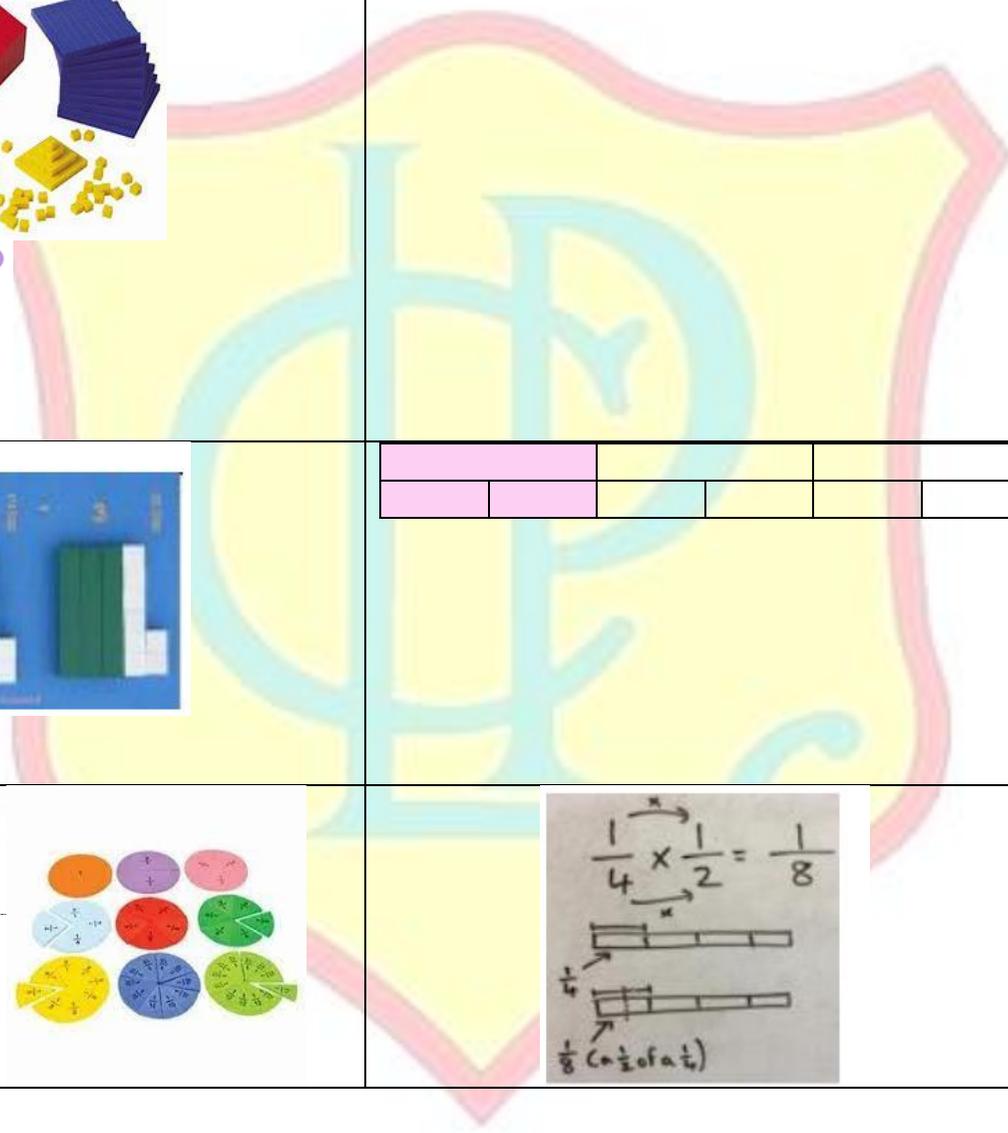
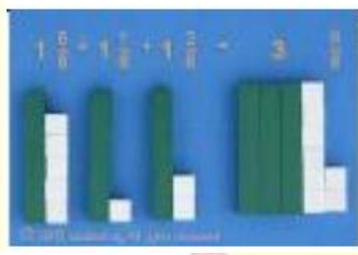
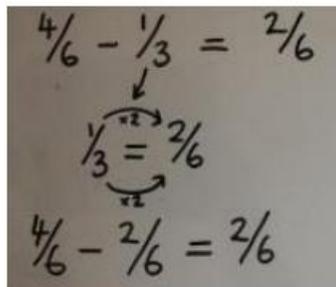
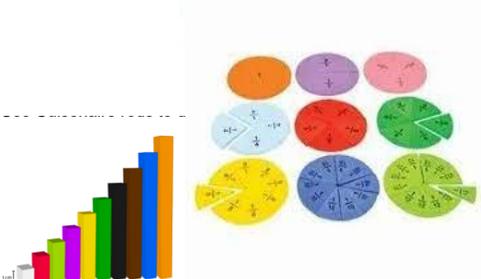
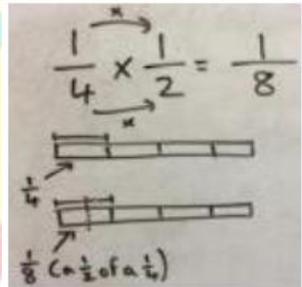
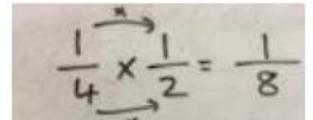
Progression in Calculations

<p>Read, write, order and compare numbers with up to three decimal places</p>	 <p>A set of base ten blocks including a red cube (1000), a blue flat (100), a green rod (10), and yellow units (1). A place value chart is also shown with columns for thousands, hundreds, tens, ones, tenths, hundredths, and thousandths.</p>	 <p>Decimal Place Value Chart</p> <table border="1"> <tr> <td>1,000</td> <td>100</td> <td>10</td> <td>1</td> <td>.</td> <td>.1</td> <td>.01</td> <td>.001</td> <td>.0001</td> <td>.00001</td> </tr> <tr> <td>Thousands</td> <td>Hundreds</td> <td>Tens</td> <td>Ones</td> <td>Tenths</td> <td>Hundredths</td> <td>Thousandths</td> <td>Ten - Thousandths</td> <td>Hundred - Thousandths</td> <td>Millionths</td> </tr> </table> <p>Decimal Place Value Mat / Chart from thousands to millionths VisuallyMontessori</p>	1,000	100	10	1	.	.1	.01	.001	.0001	.00001	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten - Thousandths	Hundred - Thousandths	Millionths	<p>$0.1 > 0.08 > 0.01$</p> <p>$1 > 0.9 > 0.3 > 0.09$</p>
1,000	100	10	1	.	.1	.01	.001	.0001	.00001														
Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten - Thousandths	Hundred - Thousandths	Millionths														
<p>Round decimals with two decimal places to the nearest whole number and to one decimal place</p>	 <p>Base ten blocks and a number line showing the number 1.6. The number line is marked from 1.0 to 2.0 in increments of 0.1, with a red dot at 1.6.</p>	<p>Round 1.6</p>  <p>Round Using a Number Line 4.76</p> <p>Whole Number: 5</p>  <p>Tenth:</p> 	<p>0.67 to the nearest tenth = 0.7</p> <p>0.67 to the nearest whole = 1</p>																				

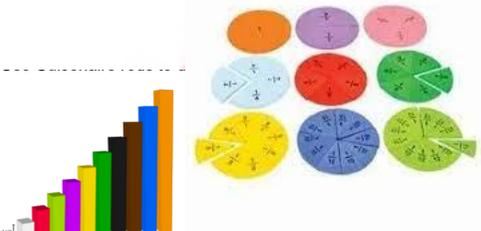
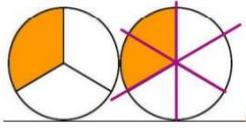
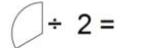
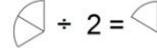
Progression in Calculations

<p>Multiply proper fractions and mixed numbers by whole numbers</p>			$\frac{5}{6} \times 4 = \frac{20}{6} = 3\frac{2}{6}$																																							
<p>Identify the value of each digit in numbers given to three decimal places</p>	<table border="1" data-bbox="548 710 907 965"> <caption>Decimal Place Value Chart</caption> <thead> <tr> <th>Millions</th> <th>Hundred Thousands</th> <th>Ten Thousands</th> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> <th>Thousandths</th> <th>Ten thousandths</th> <th>Hundred thousandths</th> <th>Millionths</th> </tr> <tr> <th>M</th> <th>HT</th> <th>T</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> <th>.</th> <th>t</th> <th>h</th> <th>th</th> <th>hth</th> <th>m</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>.</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>ink saving Eco</p>	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten thousandths	Hundred thousandths	Millionths	M	HT	T	Th	H	T	O	.	t	h	th	hth	m								.							<p>How many thousandths are in 0.543?</p>
Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten thousandths	Hundred thousandths	Millionths																														
M	HT	T	Th	H	T	O	.	t	h	th	hth	m																														
							.																																			

Progression in Calculations

													
<p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination</p>		<table border="1" data-bbox="1019 694 1668 766"> <tr> <td style="background-color: #f080f0;"></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="background-color: #f080f0;"></td> <td style="background-color: #f080f0;"></td> <td></td> <td></td> <td></td> </tr> </table>											
<p>Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]</p>													

Progression in Calculations

<p>Divide proper fractions by whole numbers</p>		<p>$\frac{1}{3} \div 2 = \frac{1}{6}$</p>  <p>or</p> <p>$\frac{1}{3} \div 2 =$  $2 =$ </p> <p>$\frac{1}{3} \div 2 =$ </p>	<p>$\frac{1}{3} \div 2 = \frac{1}{6}$</p>
---	---	---	--

