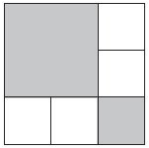
All Saints C of E Primary School

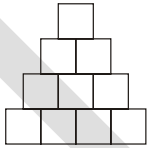
Year 4 Fractions and Decimals

By the end of Year Four, children have been taught to:

Objective	Why is it important? Things to watch out for! Taught strategies
recognise and show, using diagrams, equivalent fractions with small denominators **2/4=1/2** **2/3= 4/6** **1/5=2/10**	Equivalent fractions build heavily on visual images, as well as children's ability to spot patterns and relationships. For example, ***½ is equivalent to 2/4*** When asking children what they notice, they often say that 'the numerator in a half is double the numerator in the quarters', this can also be said for the denominator. Alternatively, this can be said that the numertor in the quarter's fraction is half the numerator in the half written fraction. The link between doubles and halves in these fractions is clear, given the right learning opportunites. Using this doubling and halving approach can be used for equivalence. The main thing is whatever we do to the numerator, the same is done to the denominator ***½= 2/4 4/8 8/16 ….*** ***Likewise 1/4 2/8 4/16…….***



The diagram is made of squares. What fraction of the diagram is shaded?



Shade $\frac{1}{5}$ of this shape.

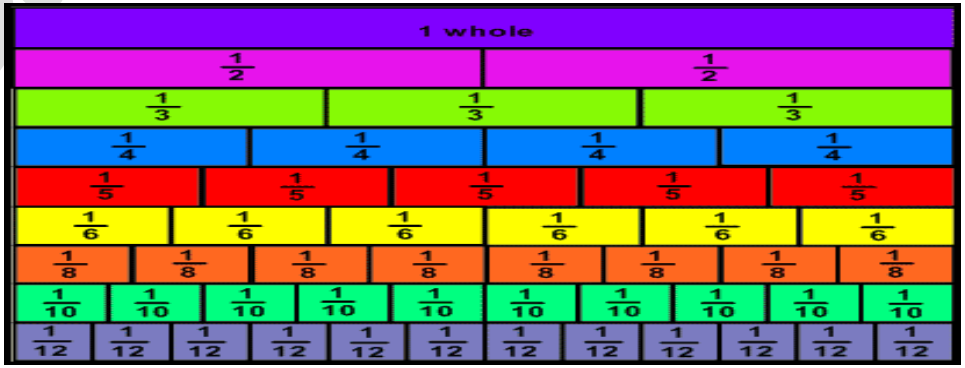
Karen makes a fraction using two number cards.



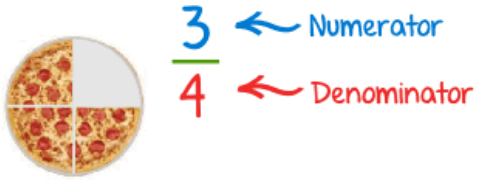
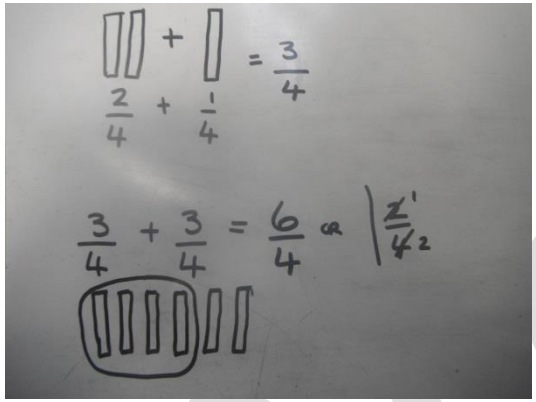
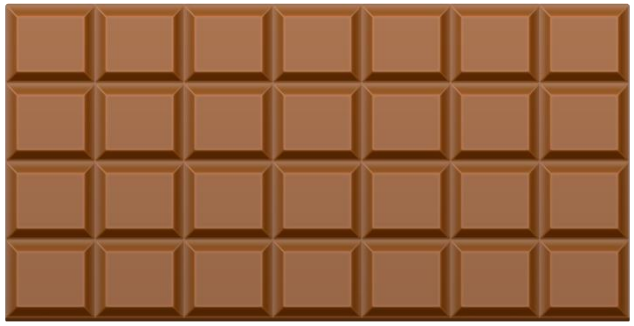
She says, ***'My fraction is equivalent to $\frac{1}{2}$ One of the number cards is 6'***

What could Karen's fraction be? Give both possible answers.

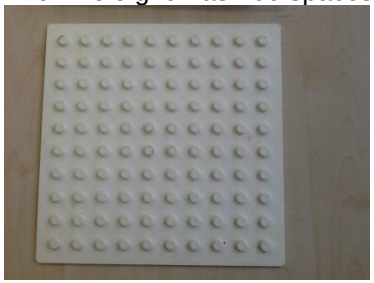
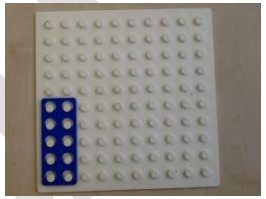
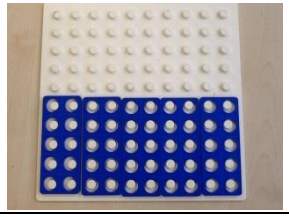
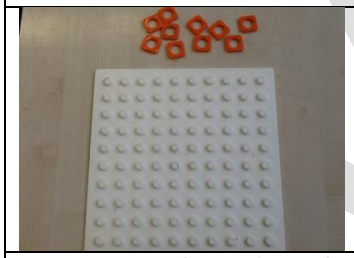
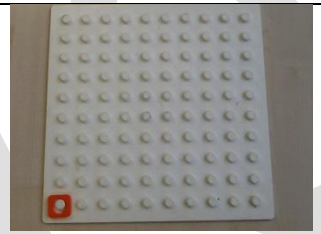
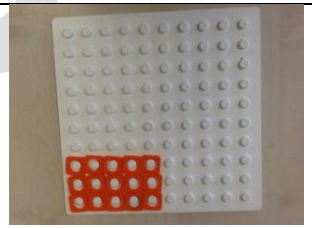
$\frac{\square}{\square}$ or $\frac{\square}{\square}$



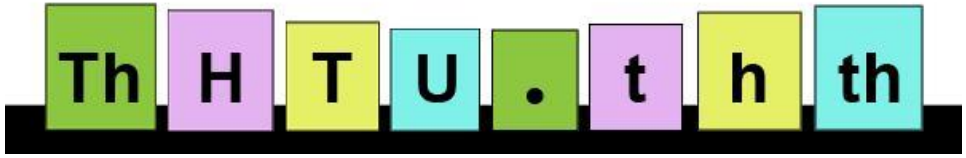
Year 4

	Maths has its own specialised language, the *numerator* and *denominator* being words that either we know or we don't. The words do not give children any clue as to what they mean or their orientation to each other in the fraction. *The denominator is the amount of parts the whole has been cut into and the numerator is the amount of parts we have.* Through practical activities and other ways of making the words memorable, is the only way to reinforce the meaning of the words. Using silly voices or creating images to make it memorable is a way that can work for some children. Darthvader (with the voice) splitting the whole in half with his light saber is one thing to try if we are feeling theatrical. 
add and subtract fractions with the same denominator	When introducing anything new, children are always given practical experiences to help develop their understanding, as well as building a visual mental image. To begin with use familiar things, such as Kit Kats (two or four finger), chocolate bars, cookies and pizzas and other items that children can relate to. These are used because their understanding of the whole is secure due to their prior everyday experiences.    When the added *numerators* exceed the *denominator*, children's understanding of equivalence is drawn upon. For example, if the answer of a calculation is six quarters, there is one lot of four in nine and two left over therefore six quarters is equivalent to **$1\frac{2}{4}$ OR $1\frac{1}{2}$** Here are some common errors children sometimes make when adding and subtracting fractions with the same denominator: • children add/subtract the denominators, as well as the numerators • children put the denominator where the numerator should be when showing the pictorial representation as a number sentence. In Year 4, the denominator is kept the same for adding and subtracting to reinforce the concept of the whole and to prepare children for learning in later years. Once children are secure adding and subtracting fractions with real life objects, we look at working with sevenths, eighths, nineths, tenths etc. We ensure we are still working with the same denominator in a calculation.

Identify the value of the digits units, , tenths and hundredths	When we introduce decimals to children, we often look at how they are used in real life first. For example, in money and in measurements to develop the idea that values on the left of the decimal point are whole and values on the right of the decimal point are parts of the whole. Children will be aware of the decimal point from money and measurement in Year 3. However, children will not have had focussed teaching regarding the place value of decimals and the equivalence to fractions. For example: £3.62 Three whole pounds 62 pence (not a whole pound) 6 tenths of a pound (60/100) PLUS 2 hundredths of a pound (2/100)=62/100 As when introducing any new concept, it is vital that children are given practical experiences to develop their understanding. Starting with the whole is a key starting point with any concrete equipment used, whether it be Numicon or money.

The whole grid has 100 spaces. 	Each blue piece of Numicon will fill 10 spaces. 	One piece of blue Numicon is worth one tenth and is covering ten out of 100 spaces. 1 = 0.1 10 	Five blue pieces of Numicon are covering five tenths of the whole grid. 5 = 0.5 - which is also equivalent to 1 10 2 
			
One orange piece of Numicon has an individual value of 1.	One piece of Numicon is covering one space out of 100. 1 = 0.01 100	Fifteen pieces of Numicon are covering fifteen out of 100. 15 = 0.15 100 0.15 partitioned is one tenth and five hundredths but together is called fifteen hundredths.	

Using Numicon and other resources enables children to really understand the value of each digit in a decimal value, as well as relating it to equivalent fractions.
When children have a clear visual image of the value, we can use other structures to help develop understanding, such as place value grids.



recognise and write decimal equivalents of any number of tenths or hundredths

Writing decimals in response to questions like, 'Show me what 4 hundredths would look like as a decimal on your whiteboard' calls on children to draw on their understanding of the value of digits and position of the digit. Some possible responses:

H	T	U	•	t	h	th	
4	0	0	•				no
		0	•	0	400		no
		0	•	4	0	0	no
		0	•	0	4		yes

It is crucial that children have created a mental image of the relative size and value of four hundredths. The responses above demonstrate how some children can represent four hundredths.

Recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$

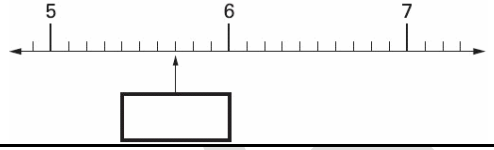
Once children can relate tenths and hundredths as fractions to decimals, they are able to move on to finding decimal equivalents of other fractions. This skill draws on children's knowledge of times tables and reducing fractions to their simplest forms.

$\frac{50}{100} = 0.5$	$\frac{\cancel{50}}{\cancel{100}_{2}} \; \frac{1}{2}$	50 goes into 50 once $\frac{1}{2}$ 50 goes into 100 twice
$\frac{25}{100} = 0.25$	$\frac{\cancel{25}}{\cancel{100}_{4}} \; \frac{1}{4}$	25 goes into 25 once $\frac{1}{4}$ 25 goes into 100 four times
$\frac{75}{100} = 0.75$		If $\frac{25}{100} = \frac{1}{4}$ $\frac{75}{100} = \frac{3}{4}$ this is because 75 is three times as large as 25, so we multiply 1 x3.

Count up and down in tenths and hundredths	Counting is a key skill to develop pattern recognition and the development of understanding. As with younger children, there are points when counting in tenths can cause challenges. When some KS1 children are counting, they find it difficult when crossing the tens boundary or hundreds boundary and this is exactly the same when counting in tenths. " 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3……." By counting in decimals it enables children to learn how we say them, which is particularly key when counting in hundredths. For example, when saying 0.25 we would say "nought point two five, not nought point twenty five"
solve simple measure and money problems involving fractions and decimals to two decimal places.	Children often have the mathematical skills and knowledge to solve problems. However, how it is worded can often cause confusion and make children doubt their mathematical ability. Problem solving is a complex skill and requires children to think more and often do more. Children begin to realise that the answer or operation to apply to the problem may not jump out at them. Children have to understand the context of the problem, the vocabulary within the problem and from that make decisions as to what they actually have to do to solve the problem. From the problems below, children need to **firstly recall their knowledge of money, fractions, decimals and time**, **then** children have to **read** and **understand** what the problem is asking them to do **and then recall** how to use an efficient **strategy** for adding, subtracting, multiplying or dividing. **Examples of problems**

A soup recipe uses 3/ 4 as many onions as carrots. Jo is making the soup and has 8 carrots. How many onions does Jo use?	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? Draw a diagram to explain your reasoning.
I pay three pounds sixty pence for a rail ticket. How much change should I get from a five pound note? Jan buys a newspaper for eighty pence and pays with a five pound note. How much change does she get?	Boat hire Motor boat £1.50 for 15minutes Rowing boat £2.50 for 1 hour How much does it cost to hire a rowing boat for three hours? Sasha pays £3.00 to hire a motor boat. She goes out at 3:20 pm. By what time must she return?

Year 4

		Arrange these decimals in order of size, with the smallest first. 4.7 14.9 2.4 4.2 0.5
	Order the values from smallest to largest. £70.07 £70.70 £7.70 £7.07	Fill in the box to show the decimal value. 

Year 4