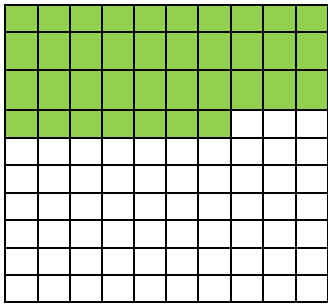
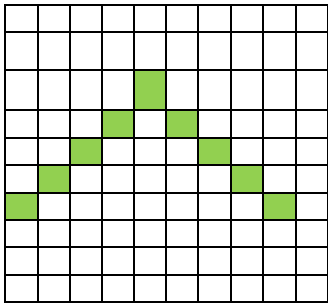


Remember our work from yesterday? Percentages are related to hundredths (parts per hundred) and are shown using the % symbol.

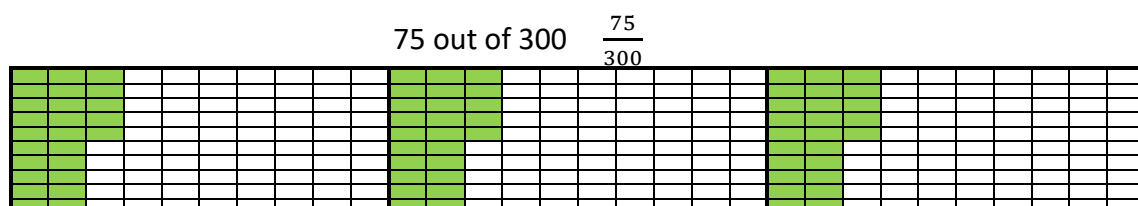
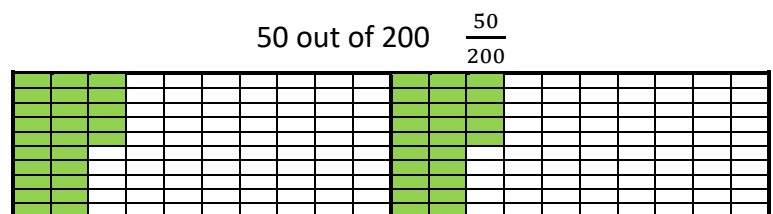
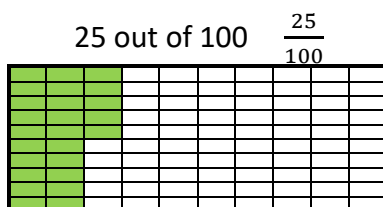
Today, we are going to consider percentages as fractions and decimals and then look at some common 'equivalents' that it would be useful for you to remember.

Let's start with percentages, fractions and decimals;

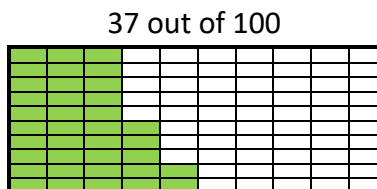
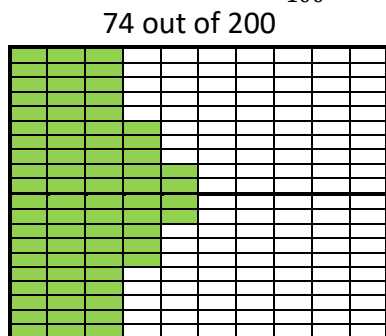
Pictorial	Percentage	Fraction	Decimal
	Thirty-seven percent	Thirty-seven hundredths	Zero point three seven
	37 parts per 100		
	37%	$\frac{37}{100}$	0.37
	Nine percent	Nine hundredths	Zero point zero nine
	9 parts per 100		
	9%	$\frac{9}{100}$	0.09

All fairly straightforward, but what if we talk to say, 200 or 300 children in a survey, rather than 100? Can we still find a percentage? The simple answer is, "Yes, we can!"

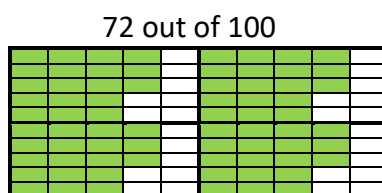
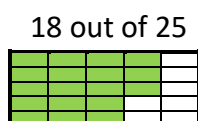
Thinking about our ice cream survey from yesterday, we saw that 25% (25 out of 100) pupils preferred chocolate ice cream to any other. If we had surveyed 200 pupils, we would have found that 50 preferred chocolate ice cream (200 is 100×2 ; 50 is 25×2). The **proportion** 50 out of 200 is the same as 25 out of 100. Similarly, had we asked 300 pupils, we would have found that 75 preferred chocolate ice cream (300 is 100×3 ; 75 is 25×3). Again, the proportion 75 out of 300 is the same as both 50 out of 200 and 25 out of 100.



What about working out a percentage from a fraction where the denominator is greater than 100? Well, let's try with this fraction; $\frac{74}{200}$. First of all, we need to decide what we can divide 200 by to get to 100 – hopefully you will spot that $200 \div 100 = 2$, so we need to divide **both** the denominator (bottom number) and numerator (top number) by 2 to get a fraction 'out of 100' or 'per 100'. Remember that dividing by two is also called 'halving'. Half of 200 (or $200 \div 2$) = 100 and half of 74 (or $74 \div 2$) is 37, so the equivalent fraction out of 100 is $\frac{37}{100}$, or 37%.



"But what if the denominator is less than 100?" you're all shouting... Let's try this; 18 out of 25, or $\frac{18}{25}$. First of all, we need to think about how many multiples of 25 will make 100, so $100 \div 25 = 4$ ($4 \times 25 = 100$). If we multiply the denominator by 4, we must also multiply the numerator by 4, so $18 \times 4 = 72$. So, $\frac{18}{25}$ is equivalent to $\frac{72}{100}$, or 72%.



This leads us neatly on to equivalent percentages, decimals and fractions. Here's a Bar Model / Fraction Wall, where the 'whole' is 100.

100 (one whole)										Percent	Decimal	Fraction
$\frac{1}{4}$	$100 \div 4 = 25$									25%	0.25	$\frac{1}{4}$
$\frac{1}{2}$	$100 \div 2 = 50$									50%	0.5	$\frac{1}{2}$
$\frac{1}{10}$	$100 \div 10 = 10$									10%	0.1	$\frac{1}{10}$
$\frac{1}{5}$	$100 \div 5 = 20$									20%	0.2	$\frac{1}{5}$

From the wall, we can work out some of the other equivalents that you might need, e.g. $\frac{3}{4}$ is three lots of $\frac{1}{4}$; we can see that $\frac{1}{4}$ is 25% or 0.25, so $\frac{3}{4}$ must be equivalent to 75% and 0.75. $\frac{6}{10}$ is six lots of $\frac{1}{10}$; we can see that $\frac{1}{10}$ is 10% or 0.1, so $\frac{6}{10}$ must be equivalent to 60% and 0.6 (on the wall, you can also see that this is equivalent to $\frac{3}{5}$).