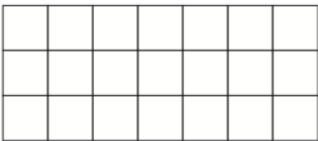
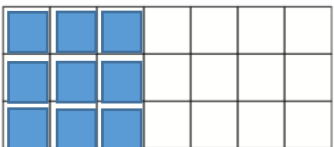


Foundation Topic: Fractions, Decimals, Percentages and Ratio 1

Topic/Skill	Definition/Tips	Example
Fraction	A mathematical expression representing the division of one integer by another. Fractions are written as two numbers separated by a horizontal line .	$\frac{2}{7}$ is a 'proper' fraction. $\frac{9}{4}$ is an ' improper ' or 'top-heavy' fraction.
Numerator	The top number of a fraction.	In the fraction $\frac{3}{5}$, 3 is the numerator.
Denominator	The bottom number of a fraction.	In the fraction $\frac{3}{5}$, 5 is the denominator.
Unit Fraction	A fraction where the numerator is one and the denominator is a positive integer.	$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ etc. are examples of unit fractions.
Fraction of a shape	Count parts of the shape equal to the denominator of the fraction and shade in parts equal to the numerator . Repeat this process until all parts of the shape have been counted.	Shade $\frac{3}{7}$ of:  There are 7 boxes per row so we shade in 3 boxes per row: 
Simplifying Fractions	Divide the numerator and denominator by the highest common factor.	$\frac{20}{45} = \frac{4}{9}$
Equivalent Fractions	Fractions which represent the same value . Numerator and denominator are multiplied or divided by the same number.	$\frac{2}{5} = \frac{4}{10} = \frac{20}{50} = \frac{60}{150}$ etc.
Mixed Number	A number formed of both an integer part and a fraction part .	$3\frac{2}{5}$ is an example of a mixed number.
Changing between improper fractions and mixed numbers	Improper fraction to mixed number - divide numerator by denominator to get whole number. The remainder is the new numerator. Mixed number to improper fraction – multiply whole number by denominator and add the numerator. The denominator always stays the same.	$\frac{17}{5} \rightarrow 17 \div 5 = 3$ remainder 2. So the mixed number is $3\frac{2}{5}$ $4\frac{1}{3} \rightarrow 4 \times 3 + 1 = 13$. So the improper fraction is $\frac{13}{3}$
Comparing Fractions	To compare fractions, they each need to be rewritten so that they have a common denominator . Ascending means smallest to biggest . Descending means biggest to smallest .	Put in to ascending order : $\frac{3}{4}, \frac{2}{3}, \frac{5}{6}, \frac{1}{2}$. Equivalent: $\frac{9}{12}, \frac{8}{12}, \frac{10}{12}, \frac{6}{12}$ Correct order: $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6}$

Using inequality signs to compare fractions	< means “is less than” > means “is greater than”	$\frac{1}{6} < \frac{1}{2}$ $\frac{3}{7} > \frac{2}{7}$
Fraction of an Amount	Divide by the bottom , times by the top	Find $\frac{2}{5}$ of £60 $60 \div 5 = 12$ $12 \times 2 = 24$
Adding or Subtracting Fractions	Find the LCM of the denominators to find a common denominator. Use equivalent fractions to change each fraction to the common denominator. Then just add or subtract the numerators and keep the denominator the same.	$\frac{2}{3} + \frac{4}{5}$ Multiples of 3: 3, 6, 9, 12, 15.. Multiples of 5: 5, 10, 15.. LCM of 3 and 5 = 15 $\frac{2}{3} = \frac{10}{15}$ $\frac{4}{5} = \frac{12}{15}$ $\frac{10}{15} + \frac{12}{15} = \frac{22}{15} = 1\frac{7}{15}$
Multiplying Fractions	Multiply the numerators together and multiply the denominators together. Then simplify .	$\frac{3}{8} \times \frac{2}{9} = \frac{6}{72} = \frac{1}{12}$
Dividing Fractions	‘Keep, Flip, Change – KFC’ Keep the first fraction the same Flip the second fraction upside down Change the divide to a multiply Multiply by the reciprocal of the second fraction.	$\frac{3}{4} \div \frac{5}{6} = \frac{3}{4} \times \frac{6}{5} = \frac{18}{20} = \frac{9}{10}$
Mixed number arithmetic	Use the same rules for adding, subtraction, multiplying , and dividing fractions but convert the mixed numbers to improper fractions first.	$2\frac{1}{3} + 1\frac{1}{5}$ $\frac{7}{3} + \frac{6}{5} = \frac{35}{15} + \frac{18}{15}$ $\frac{53}{15} = 3\frac{8}{15}$
Integers as fractions	All integers (whole numbers) can be written as fractions with denominator 1 .	$7 = \frac{7}{1}$ $45 = \frac{45}{1}$
Reciprocal	The reciprocal of a number is 1 divided by the number. The reciprocal of x is $\frac{1}{x}$ When we multiply a number by its reciprocal we get 1. This is called the ‘multiplicative inverse’.	The reciprocal of 5 is $\frac{1}{5}$ The reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$, because $\frac{2}{3} \times \frac{3}{2} = 1$

Fractions to Decimals	Divide the numerator by the denominator using the bus stop method.	$\frac{3}{8} = 3 \div 8 = 0.375$
Decimals to Fractions	Write as a fraction over 10, 100 or 1000 and simplify.	$0.36 = \frac{36}{100} = \frac{9}{25}$
Percentages to Decimals	Divide by 100	$8\% = 8 \div 100 = 0.08$
Decimals to Percentages	Multiply by 100	$0.4 = 0.4 \times 100\% = 40\%$
Fractions to Percentages	Percentage is just a fraction out of 100. Make the denominator 100 using equivalent fractions. When the denominator doesn't go in to 100, divide the numerator by the denominator and multiply by 100.	$\frac{3}{25} = \frac{12}{100} = 12\%$ $\frac{9}{16} = 9 \div 16 \times 100 = 56.25\%$
Percentages to Fractions	Percentage is just a fraction out of 100. Write the percentage over 100 and simplify.	$14\% = \frac{14}{100} = \frac{7}{50}$
Recurring decimals	A recurring decimal has a digit (or group of digits) that repeat forever. Dots are written above the first and last repeating digits.	$0.\dot{8} = 0.888888...$ $0.\dot{3}\dot{5} = 0.353535...$ $0.\dot{6}8\dot{7} = 0.687687...$
Comparing fractions, decimals and percentages	Convert all to the same form to be able to compare. Inequality signs may be used.	Compare 41% , $\frac{3}{8}$ and 0.36 $41\% = 0.41$ and $\frac{3}{8} = 0.375$ $0.36 < \frac{3}{8} < 41\%$
Percentage	Number of parts per 100.	31% means $\frac{31}{100}$
Finding 10%	To find 10%, divide 100% by 10	$10\% \text{ of } £36 = 36 \div 10 = £3.60$ $(30\% \text{ of } £36 = £3.60 \times 3 = £10.80)$
Finding 1%	To find 1%, divide 100% by 100	$1\% \text{ of } £8 = 8 \div 100 = £0.08$ $(4\% \text{ of } £8 = £0.08 \times 4 = £0.32)$
Finding 50%	To find 50%, divide 100% by 2	$50\% \text{ of } £28 = 28 \div 2 = £14$
Finding 25%	To find 25%, divide 100% by 4	$25\% \text{ of } £44 = 44 \div 4 = £11$
Finding percentages using a calculator	Change the percentage to a decimal by dividing by 100, then multiply by the amount.	$71\% \text{ of } £24 = 0.71 \times 24 = £17.04$
One number as a percentage of another	Write as a fraction and then change to a percentage.	$13 \text{ out of } 20 = \frac{13}{20} = \frac{65}{100} = 65\%$ $37 \text{ out of } 40 = \frac{37}{40} = 37 \div 40 \times 100 = 92.5\%$

Increase or Decrease by a Percentage	Non-calculator: Find the percentage and add or subtract it from the original amount. Calculator: Find the percentage multiplier and multiply.	<u>Increase 500 by 20% (Non Calc):</u> 10% of 500 = 50 so 20% of 500 = 100 500 + 100 = 600 <u>Decrease 800 by 17% (Calc):</u> 100% - 17% = 83% 83% ÷ 100 = 0.83 0.83 x 800 = 664
Percentage Multiplier	The number you multiply a quantity by to increase or decrease it by a percentage. Add or subtract from 100% and change to a decimal.	The multiplier for increasing by 12% is 1.12 The multiplier for decreasing by 12% is 0.88 The multiplier for increasing by 100% is 2.
Percentage Change	$\frac{\text{Difference}}{\text{Original}} \times 100\%$	A games console is bought for £200 and sold for £250. Difference = 250 – 200 = £50 % change = $\frac{50}{200} \times 100 = 25\%$
Profit and loss	Profit and loss are both percentage changes. Profit is an increase. Loss is a decrease.	A car was bought for £1200 and sold for £840. % loss = $\frac{360}{1200} \times 100 = 30\%$ loss
Reverse Percentage	Divide the amount by the percentage multiplier. Look out for words like 'before' or 'original'	A jumper was priced at £48.60 after a 10% reduction. Find its original price. 100% - 10% = 90% = 0.9 £48.60 ÷ 0.9 = £54
Simple Interest	Interest calculated as a percentage of the original amount.	£1000 invested for 3 years at 10% simple interest. 10% of £1000 = £100 Interest = 3 × £100 = £300
Compound interest	Interest calculated as a percentage of the current amount. Find the multiplier for the increase/decrease and raise it to the power of the number of times this interest is applied. Then multiply the original value by this.	£1000 invested for 3 years at 10% compound interest. Multiplier for 10% increase is 1.1 £1000 x 1.1³ = 1331

Where else is the FDP topic used:

Algebra Probability

Ratio and Proportion

Links to other subjects: