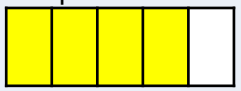
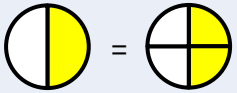
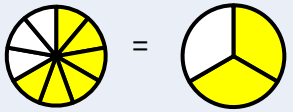
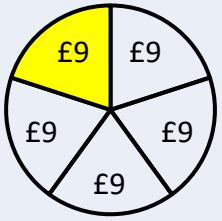
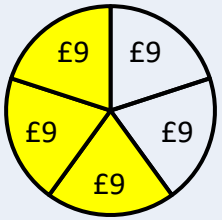
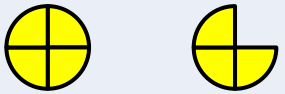
# Fractions: Introduction

| | | | | | | |
|---|---|---|---|---|---|---|
| **Keywords:** | Numerator, Denominator, Whole, Improper, Equivalent, Reciprocal | | | | | |
| **Definition / Description:** | Numerator: The numerator is the top number in a fraction | Denominator: The bottom number in a fraction, it shows what we are dividing by | Whole: An integer, a number without decimals | Improper: An improper fraction has a numerator that is larger than the denominator | Equivalent: Equivalent fractions have different numerators and denominators but have the same value | Reciprocal: The reciprocal is the inverse of any number except 0. This means a fractions numerator and denominator change places |
| **Knowledge points:** | What is a Fraction | Simplifying Fractions | Converting Fractions – Improper to Mixed number | Converting Fractions – Mixed number to improper fraction | Four operations (Addition, Subtraction, Multiplication and Division) | |
| **Knowledge point examples:** | A Fraction is a part of a whole.<br>Shade $\frac{4}{5}$ of the shape:<br>  <br>Equivalent Fractions: To generate an equivalent fraction, both numerator and denominator must be multiplied by the same amount<br>  <br>$\frac{1}{2} \overset{\times 2}{\underset{\times 2}{}} = \frac{2}{4}$ | To simplify a fraction, both numerator and denominator are divided by the same amount:<br>  <br>$\frac{6}{9} \overset{\div 3}{\underset{\div 3}{}} = \frac{2}{3}$ | To convert an improper fraction to a mixed number fraction, we divided the numerator by the denominator, we get a whole number, and a remainder, the remainder in the new numerator.<br>$\frac{5}{2} = 2\frac{1}{2}$<br>  <br>5 ÷ 2 = 2 wholes, remainder 1 | To convert a mixed number fraction, we multiply the whole number part by the denominator, and add the result to the current numerator.<br>$2\frac{1}{3} = \frac{7}{3}$<br>  <br>2 x 3 = 6<br>1 + 6 = 7 | Addition and Subtraction: To add or subtract fractions, both fractions must have the same denominators. We then add or subtract the numerators only.<br>$\frac{4}{7} + \frac{2}{7} = \frac{4+2}{7} = \frac{6}{7}$<br>$\frac{5}{7} - \frac{3}{7} = \frac{5-3}{7} = \frac{2}{7}$<br>Multiplication: To multiply fractions, we multiply numerator by numerator, and denominator by denominator.<br>$\frac{3}{5} \times \frac{2}{7} = \frac{3 \times 2}{5 \times 7} = \frac{6}{35}$<br>Division: We convert a division to a multiplication by the reciprocal.<br>$\frac{4}{7} \div \frac{2}{7} = \frac{4}{7} \times \frac{7}{2} = \frac{28}{14} = 2$ | |
| **Linked Knowledge Maps** | Fractions: Manipulation, Multiples Primes and Factors, FDP Conversion | | | | | |

# Fractions: Manipulation

| | | | |
|---|---|---|---|
| **Keywords:** | Numerator, Denominator, Whole, Improper, Equivalent, Reciprocal | | |
| **Definition / Description:** | Refer to Fractions: Introduction Knowledge map | | |
| **Knowledge points:** | Fraction of an amount | Increase / Decrease by a Fraction | Find the original amount |
| **Knowledge point examples:** | To find a fraction of an amount, we divide the amount by the denominator of the fraction, and multiply the result of this division by the fractions numerator.<br><br>Find $\frac{3}{5}$ of £45<br><br>£45 ÷ 5 = £9 which is $\frac{1}{5}$<br>  <br><br>£9 ($\frac{1}{5}$) x 3 = £27 which is $\frac{3}{5}$<br>  <br> | To Increase / Decrease by a fraction, we follow the steps of Fraction of an amount, and we add the result to the starting amount to Increase, or subtract the result from the starting amount to Decrease.<br><br>Increase £45 by $\frac{3}{5}$<br><br>£45 ÷ 5 = £9 which is $\frac{1}{5}$<br><br>£9 ($\frac{1}{5}$) x 3 = £27 which is $\frac{3}{5}$<br><br>£45 + £27 = £72<br><br>Decrease £45 by $\frac{3}{5}$<br><br>£45 ÷ 5 = £9 which is $\frac{1}{5}$<br><br>£9 ($\frac{1}{5}$) x 3 = £27 which is $\frac{3}{5}$<br><br>£45 - £27 = £18 | To find the original amount, we need to identify how many equal parts we now have. We divide the amount by how many parts we have, and multiply by how many we should have had.<br><br>A price was increase by $\frac{3}{4}$ to £70. How much was the original price?<br><br>$\frac{4}{4} + \frac{3}{4} = \frac{7}{4}$<br>  <br>As we are dealing with $\frac{1}{4}s$,<br><br>the original must be $\frac{4}{4}$, and after the increase we have $\frac{7}{4}$<br>So we divide the amount (£70) by 7 to find $\frac{1}{4}$, and multiply by 4 to find $\frac{4}{4}$ (The original amount)<br>£70 ÷ 7 = £10<br>£10 x 4 = £40 |
| **Linked Knowledge Maps** | Fractions: Introduction, Multiples Primes and Factors, FDP Conversion | | |