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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Fractions** |
| 1. Fraction | A mathematical expression representing the **division** of one integer by another.  Fractions are written as **two numbers separated by a horizontal line**. | is a ‘proper’ fraction.  is an ‘improper’ or ‘top-heavy’ fraction. |
| 2. Numerator | The **top** number of a fraction. | In the fraction , 3 is the numerator. |
| 3. Denominator | The **bottom** number of a fraction. | In the fraction , 5 is the denominator. |
| 4. Unit Fraction | A fraction where the **numerator is one** and the denominator is a positive integer. | are examples of unit fractions. |
| 5. Reciprocal | The reciprocal of a number is **1 divided by the number**.  The reciprocal of is  **When we multiply a number by its reciprocal we get 1**. This is called the ‘multiplicative inverse’. | The reciprocal of is  The reciprocal of is , because |
| 6. Mixed Number | A number formed of both an **integer part** and a **fraction part**. | is an example of a mixed number. |
| 7. Simplifying Fractions | **Divide the numerator and denominator by the highest common factor**. |  |
| 8. Equivalent Fractions | Fractions which represent the **same value**. |  |
| 9. 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 : .  Equivalent:  Correct order: |
| 10. Fraction of an Amount | **Divide** by the **bottom**, **times** by the **top** | Find of £60 |
| 11. 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**. | Multiples of 3: 3, 6, 9, 12, **15**..  Multiples of 5: 5, 10, **15**..  LCM of 3 and 5 = 15 |
| 12. Multiplying Fractions | **Multiply** the **numerators** together and **multiply** the **denominators** together. |  |
| 13. Dividing Fractions | **‘Keep it, Flip it, Change it – 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. |  |

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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Basic Percentages** |
| 1. Percentage | **Number of parts per 100.** | means |
| 2. Finding 10% | To find **10%**, **divide by 10** | 10% of £36 = 36÷10=£3.60 |
| 3. Finding 1% | To find **1%**, **divide by 100** | 1% of £8 = 8÷100 = £0.08 |
| 4. Percentage Change |  | A games console is bought for £200 and sold for £250.  % change = |
| 5. Fractions to Decimals | **Divide the numerator by the denominator** using the bus stop method. |  |
| 6. Decimals to Fractions | **Write as a fraction** over 10, 100 or 1000 and simplify. |  |
| 7. Percentages to Decimals | **Divide by 100** |  |
| 8. Decimals to Percentages | **Multiply by 100** |  |
| 9. 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, use a calculator and **multiply the fraction by 100**. |  |
| 10. Percentages to Fractions | Percentage is just a fraction out of 100.  **Write the percentage over 100** and simplify. |  |

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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Calculating with Percentages** |
| 1. 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. | Increase 500 by 20% (Non Calc):  10% of 500 = 50  so 20% of 500 = 100  500 + 100 = 600  Decrease 800 by 17% (Calc):  100%-17%=83%  83% ÷ 100 = 0.83  0.83 x 800 = 664 |
| 2. Percentage Multiplier | The **number** you **multiply** a quantity by to **increase or decrease** it by a **percentage**. | 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. |
| 3. Reverse Percentage | Find the **correct percentage given in the question**, then work backwards to **find 100%**  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%  90% = £48.60  1% = £0.54  100% = £54 |
| 4. 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 = |

**Knowledge Organiser**