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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Basic Number and Decimals** |
| 1. Integer | A **whole number** that can be positive, negative or zero. |  |
| 2. Decimal | A number with a **decimal point** in it. Can be positive or negative. |  |
| 3. Negative Number | A number that is **less than zero**. Can be decimals. |  |
| 4. Addition | To find the **total**, or **sum**, of two or more numbers.  ‘add’, ‘plus’, ‘sum’ |  |
| 5. Subtraction | To find the **difference** between two numbers.  To find out how many are left when some are taken away.  ‘minus’, ‘take away’, ‘subtract’ |  |
| 6. Multiplication | Can be thought of as **repeated addition**.  ‘multiply’, ‘times’, ‘product’ |  |
| 7. Division | Splitting into equal parts or groups.  The process of calculating the **number of times one number is contained within another one**.  ‘divide’, ‘share’ |  |
| 8. Remainder | The amount ‘**left over**’ after dividing one integer by another. | The remainder of is , because 6 divides into 20 exactly 3 times, with 2 left over. |
| 9. BIDMAS | An acronym for the **order** you should do calculations in.  BIDMAS stands for **‘Brackets, Indices, Division, Multiplication, Addition and Subtraction’**.  Indices are also known as ‘powers’ or ‘orders’.  With strings of division and multiplication, or strings of addition and subtraction, and no brackets, work from left to right. | , where the 2 is the index/power. |
| 10. Recurring Decimal | A decimal number that has **digits that repeat forever**.  The part that repeats is usually shown by placing a dot above the digit that repeats, or dots over the first and last digit of the repeating pattern. |  |

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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Factors and Multiples** |
| 1. Multiple | The result of multiplying a number by an integer.  The **times tables** of a number. | The first five multiples of 7 are: |
| 2. Factor | A number that **divides exactly** into another number without a remainder.  It is useful to write factors in pairs | The factors of 18 are:  The factor pairs of 18 are: |
| 3. Lowest Common Multiple (LCM) | The **smallest** number that is in the **times tables** of each of the numbers given. | The LCM of 3, 4 and 5 is 60 because it is the smallest number in the 3, 4 and 5 times tables. |
| 4. Highest Common Factor (HCF) | The **biggest** number that **divides exactly** into two or more numbers. | The HCF of 6 and 9 is 3 because it is the biggest number that divides into 6 and 9 exactly. |
| 5. Prime Number | A number with **exactly two factors**.  A number that can only be divided by itself and one.  The number **1 is not prime**, as it only has one factor, not two. | The first ten prime numbers are: |
| 6. Prime Factor | A factor which is a prime number. | The prime factors of 18 are: |
| 7. Product of Prime Factors | Finding out which **prime numbers multiply** together to make the **original** number.  Use a **prime factor tree.**  Also known as ‘prime factorisation’. |  |

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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Indices** |
| 1. Square Number | The number you get when you **multiply a number by itself**. | **1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225…** |
| 2. Square Root | The **number you multiply by itself** to get another number.  The reverse process of squaring a number. | because |
| 3. Solutions to | **Equations** involving **squares** have **two solutions**, one **positive** and one **negative**. | Solve  This can also be written as |
| 4. Cube Number | The number you get when you **multiply a number by itself and itself again**. | 1, 8, 27, 64, 125… |
| 5. Cube Root | The **number you multiply by itself and itself again** to get another number.  The reverse process of cubing a number. | because |
| 6. Powers of… | The powers of a number are that **number raised to various powers**. | The powers of 3 are:        etc. |
| 7. Multiplication Index Law | When **multiplying** with the same base (number or letter), **add the powers**. |  |
| 8. Division Index Law | When **dividing** with the same base (number or letter), **subtract the powers**. |  |
| 9. Brackets Index Laws | When raising a power to another power, multiply the powers together. |  |
| 10. Notable Powers |  |  |
| 11. Negative Powers | A negative power performs the reciprocal. |  |
| 12. Fractional Powers | The denominator of a fractional power acts as a ‘root’.  The numerator of a fractional power acts as a normal power. |  |
| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Standard Form** |
| 1. Standard Form |  | 8400 = 8.4 x  0.00036 = 3.6 x |
| 2. Multiplying or Dividing with Standard Form | Multiply: **Multiply the numbers** and **add the powers**.  Divide: **Divide the numbers** and **subtract the powers**. |  |
| 3. Adding or Subtracting with Standard Form | **Convert** in to **ordinary** numbers, **calculate** and then **convert back** in to standard form |  |

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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Accuracy** |
| 1. Place Value | The **value** of where a **digit** is within a number. | In 726, the value of the 2 is 20, as it is in the ‘tens’ column. |
| 2. Place Value Columns | The names of the columns that **determine the value of each digit**.  The ‘ones’ column is also known as the ‘units’ column. | Image result for place value columns |
| 3. Rounding | To make a number simpler but keep its value close to what it was.  If the **digit to the right** of the rounding digit is **less than 5, round down**.  If the **digit to the right** of the rounding digit is **5 or more, round up**. | 74 rounded to the nearest ten is 70, because 74 is closer to 70 than 80.  152,879 rounded to the nearest thousand is 153,000. |
| 4. Decimal Place | The **position** of a digit to the **right of a decimal point**. | In the number 0.372, the 7 is in the second decimal place.  0.372 rounded to two decimal places is 0.37, because the 2 tells us to round down.  Careful with money - don’t write £27.4, instead write £27.40 |
| 5. Significant Figure | The significant figures of a number are the digits which **carry meaning** (ie. are significant) to the size of the number.  The **first significant figure** of a number **cannot be zero**.  In a number with a decimal, trailing zeros are not significant. | In the number 0.00821, the first significant figure is the 8.  In the number 2.740, the 0 is not a significant figure.  0.00821 rounded to 2 significant figures is 0.0082.  19357 rounded to 3 significant figures is 19400. We need to include the two zeros at the end to keep the digits in the same place value columns. |
| 6. Truncation | A method of approximating a decimal number by **dropping all decimal places** past a certain point **without rounding**. | 3.14159265… can be truncated to 3.1415 (note that if it had been rounded, it would become 3.1416) |
| 7. Error Interval | A **range of values** that a number could have taken before being rounded or truncated.  An error interval is written using inequalities, with a **lower bound** and an **upper bound**.  Note that the lower bound inequality can be ‘equal to’, but the upper bound cannot be ‘equal to’. | 0.6 has been rounded to 1 decimal place.  The error interval is:  The lower bound is 0.55  The upper bound is 0.65 |
| 8. Estimate | To find something **close to the correct answer**. | An estimate for the height of a man is 1.8 metres. |
| 9. Approximation | When using approximations to estimate the solution to a calculation, **round each number in the calculation to 1 significant figure**.  means ‘approximately equal to’ | ‘Note that dividing by 0.5 is the same as multiplying by 2’ |
| 10. Rational Number | A number of the form **,** where  **and are integers** and  A number that cannot be written in this form is called an ‘irrational’ number | are examples of rational numbers.  are examples of an irrational numbers. |
| 11. Surd | The **irrational number** that is a **root of a positive integer,** whose value cannot be determined exactly.  Surds have **infinite non-recurring decimals**. | is a surd because it is a root which cannot be determined exactly.  which never repeats. |
| 12. Rules of Surds |  |  |
| 13. Rationalise a Denominator | The process of rewriting a fraction so that the **denominator contains only rational numbers**. |  |

**Knowledge Organiser**