**Curriculum Related Expectations**

HT4: Reasoning with Number

**Students can define the following terms:**

|  |  |  |
| --- | --- | --- |
| Cube  | Difference  | Directed |
| Exponent | Factor  | Fraction |
| Integer | Inverse | Irrational |
| Multiple | Negative | Operation |
| Positive | Power | Prime |
| Product | Quotient | Rational |
| Root | Simplify | Square |
| Sum | Surd |  |

**Students know:**

* A deeper understanding of the number system including rational and real numbers, with the higher strand also looking at simple surds.
* Number skills both with and without a calculator as necessary including standard form and HCF/LCM.
* An extension on prior learning relating to fractions and decimals.
* How to complete reverse percentage problems with higher attainers stretched by looking at repeated percentage change.
* What decimals multipliers are and how to use them within calculations.
* Number skills in various financial contexts.
* The language of financial mathematics.
* Simple ideas of taxes and wages and percentages applied in contexts including simple and compound interest.

**Students can:**

* Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
* Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, HCF, LCM, prime factorisation, including using product notation and the unique factorisation property.
* Interpret and compare numbers in standard form $A×10^{n}$, $1\leq n<10$ where $n$ is a positive or negative integer or zero.
* Appreciate the infinite nature of the sets of integers, real and rational numbers.
* Define percentage as ‘number of parts per hundred’, interpret percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100.
* Interpret fractions and percentages as operators.
* Solve problems involving percentage change, including percentage increase, decrease and original value problems and simple interest in financial mathematics.
* Select and use appropriate calculation strategies to solve increasingly complex problems.
* Interpret when the structure of a numerical problem requires additive, multiplicative, or proportional reasoning.
* Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics.