Big Ideas

Big Ideas are the building blocks of subjects. They are: -

- Concepts and ideas that helps us make sense of lots of otherwise isolated or disconnected facts.
- Principles, theories, or processes that serve as a focal point of a subject.
- Something that changes the way we think about information or schema.

The big ideas in this subject are: -

Big Idea	Description
Number	**Numbers** set of real numbers is infinite, each real number can be associated with a unique point on a number line **Base 10** numeration system is a scheme for recording numbers using digits 0-9, groups of ten & place value **Equivalence** any number, measure, numerical expression, algebraic expression or equation can be represented in an infinite number of ways that have the same value **Comparison** numbers, expressions & measures can be compared by their relative values **Operation Meanings & Relationships** same number sentence can be associated with different concrete or real-world situations AND different number sentences can be associated with the same concrete / real-world situation **Properties** for a given set of numbers there are relationships that are always true & these are rules that govern arithmetic & algebra **Basic Facts & Algorithms** basic facts & algorithms for operations with rational numbers use notations of equivalence to transform calculations into simpler ones **Estimation** numerical calculations can be approximated by replacing numbers with other numbers that are close & easy to compute with mentally. Measurements can be approximated using known referenets as the unit in the measurement process **Patterns** relationships can be describe & generalisations made for mathematical situations that have numbers / objects that repeat in predictable ways **Equations & Inequalities** rules of arithmetic & algebra can be used together with notations of equivalence to transform equations & inequalities so solutions can be found
Algebra	**Equivalence** any number, measure, numerical / algebraic expression or equation can be represented in an infinite number of ways that have the same value **Comparison** numbers, expressions & measures can be compared by their relative values **Properties** for a given set of numbers there are relationships that are always true & these are the rules that govern arithmetic & algebra **Basic Facts & Algorithms** basic facts & algorithms for operations with rational numbers use notions if equivalence to transform calculations into simpler ones **Patterns** relationships can be described & generalisations made for mathematical situations that have numbers / objects that repeat in predictable ways **Variable** mathematical situations & structures can be translated & represented abstractly using variables, expressions & equations **Proportionality** if two quantities vary proportionally, that relationship can be represented as a linear function **Relations & Functions** mathematical rules (relations) can be used to assign members of one set to members of another set. A special rule (function) assigns each number of one set to a unique member of the other set **Proof** mathematical statements can be proved / disproved using previously established statements, self-evident truths or assumed statements. This may be through the use of physical objects, diagrams, manipulatives or algebra **Equations & Inequalities** rules of arithmetic & algebra can be used together with notions of equivalence to transform equations & inequalities so solutions can be found
Ratio & Proportion	**Comparison** numbers, expressions & measures can be compared by their relative values **Operation Meanings & Relationships** the same number sentence can be associated with different concrete / real-world situations AND different number sentences can be associated with the same concrete or real-world situation **Properties** for a given set of numbers there are relationships that are always true & these are the rules that govern arithmetic & algebra **Patterns** relationships can be described & generalisations made for mathematical situations that have numbers / objects that repeat in predictable ways **Variable** mathematical situations & structures can be translated & represented abstractly using variables, expressions & equations **Proportionality** if two quantities vary proportionally, that relationship can be represented as a linear function **Relations & Functions** mathematical rules (relations) can be used to assign members of one set to members of another set. A special rule (function) assigns each number of one set to a unique member of the other set

Geometry	**Patterns** relationships can be described & generalisations made for mathematical situations that have numbers / objects that repeat in predictable ways **Shapes & Solids** 2- & 3-D objects with / without curved surfaces can be described, classified & analysed by their attributes **Orientation & Location** objects in space can be oriented in an infinite number of ways & an object's location in space can be described quantitatively **Transformations** objects in space can be transformed in an infinite number of ways & those transformations can be described & analysed mathematically **Measurement** some attributes of objects are measurable & can be quantified using unit amounts **Proof** mathematical statements can be proved / disproved using previously established statements, self-evident truths or assumed statements. This may be through the use of physical objects, diagrams, manipulatives or algebra **Classification** abstract & concrete mathematical items can be grouped according to their characteristics
Statistics & Probability	**Data Collection** some questions can be answered by collecting & analysing data & the question to be answered determines the data that needs to be collected & how best to collect it **Data Representation** data can be represented visually using tables, charts & graphs. The type of data determines the best choice of visual representation **Data Distribution** there are special numerical measures that describe the centre & spread of numerical data sets **Chance** the chance of an event occurring can be described numerically by a number between 0 & 1 inclusive & used to make predictions about other events