# Scheme of Learning: Year 7 Autumn Term

## Topic Sequence: Algebraic Thinking

| 1 | 2 | 3 |
|---|---|---|
| Sequences | Understand and Use Algebraic Notation | Equality and Equivalence |

## Topic Overview: Sequences

The focus of these lesson is for the students to develop a deep understanding of the basic algebraic forms, with more complex expressions being dealt with later. Functions machine are used alongside letter notation, with time invested in single function machines and the links to inverse operations before moving on to series of two machines and substitution into short abstract expressions.

## Learning Sequence:

Single Function Machines (Number): Students will need to become fluent in the use of single function machines with numbers working from left to right. Students will familiarise themselves with the associated vocabulary such as “input” and “output.”

Using letters to generalize number and finding functions from expressions: Here students are explicitly taught algebraic notation as a representation of number.

Single functions machines (algebra): Students to link the ideas from the previous lessons to reinforce understanding of algebra.

Substitution with one variable: Students are practicing their calculator skills and using the expressions they have learnt in the more abstract context of stand-alone expressions.

Two Step function machines (number): Moving onto functions machines with two functions, where the output of the first function is the input of the second. Students need to become fluent in this process with numbers, both forward and backward, before moving on to the next step where they use concrete objects, diagrams and letters.

Two Step function machines (algebra): Building on experience of two functions by using objects, bar models and letters. The will be taught that the order in which the functions are applied is important and that brackets are used to distinguish between the order of the functions

Substitution with two or more variables: Substituting repeatedly into the same expression is a valuable experience with opportunities for discovery. Students can compare the similarities and differences between expressions (eg 3a + 2 and 3(a + 2)) for a wide variety of inputs

Generate sequences from a rule: Students with revisit ideas from the previous topic and combined this knowledge with that of the substitution they have just learnt.

Represent sequences and function machines graphically: Students use technology to plot the graphs of some of the functions they have been working on to reinforce the vocabulary of linear and non-linear.

| Sequence of Learning: | |
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| 1 | To describe and continue a sequence given diagrammatically |
| 2 | Predict and check the next term and/or terms of a sequence |
| 3 | To represent sequences in tabular and graphical forms |
| 4 | Linear and non-linear sequences |
| 5 | Single Function machines |
| 6 | Using letters to generalise number and finding functions from expressions |
| 7 | Single function machines with algebra |
| 8 | Substitution with one variable |
| 9 | Two step function machines |
| 10 | Two step function machines with algebra |
| 11 | Substitution with two or more variables |
| 12 | Generate a sequence from a rule |
| 13 | Represent sequences and functions graphically |

| Topic Resources: | |
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| Knowledge Maps: | Algebraic Manipulation and Notation |

| Assessment: | |
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| Knowledge: | End of Topic Test |
| Application of Knowledge: | Termly mixed topic assessments |

| Supportive Reading: | |
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| Any supported reading listed here | Sparx Maths www.sparxmaths.co.uk |
| | Corbett Maths : www.corbettmaths.com |
| | AQA Revision Guide |