

Main Criteria: Forward Education
Secondary Criteria: National Curriculum for England
Subjects: Mathematics, Science, Technology Education
Grades: 9, 10, Key Stage 3, Key Stage 4

Forward Education

Replanting our Forests with Automated Tree Seeders

National Curriculum for England
Mathematics
Grade **Key Stage 3** - Adopted: 2014

PROGRAMME OF STUDY	UK.MA.Y7-9.1.	Year 7-9 – Working mathematically
STRAND		Through the mathematics content, pupils should be taught to:
STATUTORY REQUIREMENT	MA.Y7-9.1.1.	Develop fluency

STATUTORY REQUIREMENT MA.Y7-9.1.1.2. Select and use appropriate calculation strategies to solve increasingly complex problems.

STATUTORY REQUIREMENT MA.Y7-9.1.1.5. Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs].

PROGRAMME OF STUDY	UK.MA.Y7-9.1.	Year 7-9 – Working mathematically
STRAND		Through the mathematics content, pupils should be taught to:
STATUTORY REQUIREMENT	MA.Y7-9.1.2.	Reason mathematically

STATUTORY REQUIREMENT MA.Y7-9.1.2.2. Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically.

STATUTORY REQUIREMENT MA.Y7-9.1.2.5. Begin to reason deductively in geometry, number and algebra, including using geometrical constructions.

PROGRAMME OF STUDY	UK.MA.Y7-9.1.	Year 7-9 – Working mathematically
STRAND		Through the mathematics content, pupils should be taught to:
STATUTORY REQUIREMENT	MA.Y7-9.1.3.	Solve problems

STATUTORY REQUIREMENT MA.Y7-9.1.3.1. Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.

STATUTORY REQUIREMENT MA.Y7-9.1.3.2. Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics.

STATUTORY REQUIREMENT MA.Y7-9.1.3.3. Begin to model situations mathematically and express the results using a range of formal mathematical representations.

PROGRAMME OF STUDY	UK.MA.Y7-9.4.	Ratio, proportion and rates of change
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STRAND		Pupils should be taught to:
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STATUTORY REQUIREMENT	MA.Y7-9.4.5.	Divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio.
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STATUTORY REQUIREMENT	MA.Y7-9.4.6.	Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction.
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PROGRAMME OF STUDY	UK.MA.Y7-9.7.	Statistics
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STRAND		Pupils should be taught to:
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STATUTORY REQUIREMENT	MA.Y7-9.7.1.	Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers).
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**National Curriculum for England
Mathematics
Grade Key Stage 4 - Adopted: 2014**

PROGRAMME OF STUDY	UK.MA.Y10-11.1.	Year 10-11 – Working mathematically
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STRAND		Through the mathematics content, pupils should be taught to:
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STATUTORY REQUIREMENT	MA.Y10-11.1.1.	Develop fluency
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STATUTORY REQUIREMENT	MA.Y10-11.1.1.2.	Select and use appropriate calculation strategies to solve increasingly complex problems, including exact calculations involving multiples of π {and surds}, use of standard form and application and interpretation of limits of accuracy.
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STATUTORY REQUIREMENT	MA.Y10-11.1.1.5.	Move freely between different numerical, algebraic, graphical and diagrammatic representations, including of linear, quadratic, reciprocal, {exponential and trigonometric} functions.
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PROGRAMME OF STUDY	UK.MA.Y10-11.1.	Year 10-11 – Working mathematically
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STRAND		Through the mathematics content, pupils should be taught to:
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STATUTORY REQUIREMENT	MA.Y10-11.1.2.	Reason mathematically
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STATUTORY REQUIREMENT	MA.Y10-11.1.2.1.	Extend and formalise their knowledge of ratio and proportion, including trigonometric ratios, in working with measures and geometry, and in working with proportional relations algebraically and graphically.
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STATUTORY REQUIREMENT	MA.Y10-11.1.2.4.	Reason deductively in geometry, number and algebra, including using geometrical constructions.
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PROGRAMME OF STUDY	UK.MA.Y10-11.1.	Year 10-11 – Working mathematically
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STRAND		Through the mathematics content, pupils should be taught to:
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STATUTORY REQUIREMENT	MA.Y10-11.1.3.	Solve problems
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STATUTORY REQUIREMENT MA.Y10-11.1.3.1. Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.

STATUTORY REQUIREMENT MA.Y10-11.1.3.2. Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial contexts.

PROGRAMME OF STUDY	UK.MA.Y10-11.1.	Year 10-11 – Working mathematically
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STRAND Through the mathematics content, pupils should be taught to:

STATUTORY REQUIREMENT	MA.Y10-11.1.4.	Mathematics
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STATUTORY REQUIREMENT MA.Y10-11.1.4.1. Model situations mathematically and express the results using a range of formal mathematical representations, reflecting on how their solutions may have been affected by any modelling assumptions.

PROGRAMME OF STUDY	UK.MA.Y10-11.2.	Year 10-11 – Number
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STRAND In addition to consolidating subject content from key stage 3, pupils should be taught to:

STATUTORY REQUIREMENT MA.Y10-11.2.7. Identify and work with fractions in ratio problems.

PROGRAMME OF STUDY	UK.MA.Y10-11.4.	Year 10-11 – Ratio, proportion and rates of change
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STRAND In addition to consolidating subject content from key stage 3, pupils should be taught to:

STATUTORY REQUIREMENT MA.Y10-11.4.4. Interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion.

National Curriculum for England

Science

Grade **Key Stage 3** - Adopted: 2014

PROGRAMME OF STUDY	UK.SC.Y7-9.WS.	YEARS 7-9 - Working scientifically
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STRAND **SC.Y7-9.WS.3.** Analysis and evaluation

STATUTORY REQUIREMENT		Through the content across all three disciplines, pupils should be taught to:
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STATUTORY REQUIREMENT SC.Y7-9.WS.3.4. Present reasoned explanations, including explaining data in relation to predictions and hypotheses.

PROGRAMME OF STUDY	UK.SC.Y7-9.B.	YEARS 7-9 - Biology
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STRAND **SC.Y7-9.B.3.** Interactions and interdependencies

STATUTORY REQUIREMENT	SC.Y7-9.B.3.1.	Relationships in an ecosystem
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STATUTORY REQUIREMENT		Pupils should be taught about:
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STATUTORY REQUIREMENT SC.Y7-9.B.3.1.c. How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

PROGRAMME OF STUDY	UK.SC.Y7-9.B.	YEARS 7-9 - Biology
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STRAND	SC.Y7-9.B.4.	Genetics and evolution
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STATUTORY REQUIREMENT	SC.Y7-9.B.4.1.	Inheritance, chromosomes, DNA and genes
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STATUTORY REQUIREMENT		Pupils should be taught about:
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STATUTORY REQUIREMENT SC.Y7-9.B.4.1.f. Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.

STATUTORY REQUIREMENT SC.Y7-9.B.4.1.g. The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.

PROGRAMME OF STUDY	UK.SC.Y7-9.C.	YEARS 7-9 - Chemistry
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STRAND	SC.Y7-9.C.8.	Earth and Atmosphere
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STATUTORY REQUIREMENT		Pupils should be taught about:
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STATUTORY REQUIREMENT SC.Y7-9.C.8.5. The carbon cycle.

STATUTORY REQUIREMENT SC.Y7-9.C.8.7. The production of carbon dioxide by human activity and the impact on climate.

**National Curriculum for England
Science
Grade Key Stage 4 - Adopted: 2014**

PROGRAMME OF STUDY	UK.SC.Y10-11.WS.	YEARS 10-11 - Working scientifically
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STRAND	SC.Y10-11.WS.1.	The development of scientific thinking
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STATUTORY REQUIREMENT		Through the content across all three disciplines, students should be taught so that they develop understanding and first-hand experience of:
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STATUTORY REQUIREMENT SC.Y10-11.WS.1.4. Explaining everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments.

PROGRAMME OF STUDY	UK.SC.Y10-11.WS.	YEARS 10-11 - Working scientifically
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STRAND	SC.Y10-11.WS.3.	Analysis and evaluation
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STATUTORY REQUIREMENT		Through the content across all three disciplines, students should be taught so that they develop understanding and first-hand experience of:
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STATUTORY REQUIREMENT	SC.Y10-11.WS.3.1.	Applying the cycle of collecting, presenting and analysing data, including:
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STATUTORY REQUIREMENT SC.Y10-11.WS.3.1.f. Presenting reasoned explanations, including relating data to hypotheses.

PROGRAMME OF STUDY	UK.SC.Y10-11.WS.	YEARS 10-11 - Working scientifically
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STRAND	SC.Y10-11.WS.4.	Vocabulary, units, symbols and nomenclature
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STATUTORY REQUIREMENT		Through the content across all three disciplines, students should be taught so that they develop understanding and first-hand experience of:
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STATUTORY REQUIREMENT SC.Y10-11.WS.4.1. Developing their use of scientific vocabulary and nomenclature.

PROGRAMME OF STUDY	UK.SC.Y10-11.B.	YEARS 10-11 - Biology
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STRAND	SC.Y10-11.B.1.	Biology is the science of living organisms (including animals, plants, fungi and microorganisms) and their interactions with each other and the environment. The study of biology involves collecting and interpreting information about the natural world to identify patterns and relate possible cause and effect. Biology is used to help humans improve their own lives and to understand the world around them. Students should be helped to understand how, through the ideas of biology, the complex and diverse phenomena of the natural world can be described in terms of a number of key ideas which are of universal application, and which can be illustrated in the separate topics set out below. These ideas include:
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STATUTORY REQUIREMENT SC.Y10-11.B.1.7. The chemicals in ecosystems are continually cycling through the natural world.

PROGRAMME OF STUDY	UK.SC.Y10-11.B.	YEARS 10-11 - Biology
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STRAND	SC.Y10-11.B.7.	Ecosystems
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STATUTORY REQUIREMENT SC.Y10-11.B.7.3. How materials cycle through abiotic and biotic components of ecosystems.

STATUTORY REQUIREMENT SC.Y10-11.B.7.6. The importance of biodiversity.

STATUTORY REQUIREMENT SC.Y10-11.B.7.8. Positive and negative human interactions with ecosystems.

PROGRAMME OF STUDY	UK.SC.Y10-11.C.	YEARS 10-11 - Chemistry
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STRAND	SC.Y10-11.C.9.	Earth and atmospheric science
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STATUTORY REQUIREMENT SC.Y10-11.C.9.2. Evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change.

STATUTORY REQUIREMENT	SC.Y10-11.C.9.3.	Potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate.
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**National Curriculum for England
Technology Education
Grade Key Stage 3 - Adopted: 2014**

PROGRAMME OF STUDY	UK.CO.	Computing
STRAND		Pupils should be taught to:

STATUTORY REQUIREMENT	CO.2.	Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem.
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STATUTORY REQUIREMENT	CO.3.	Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions.
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**National Curriculum for England
Technology Education
Grade Key Stage 4 - Adopted: 2014**

PROGRAMME OF STUDY	UK.CO.	Computing
STRAND		All pupils must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career. All pupils should be taught to:

STATUTORY REQUIREMENT	CO.2.	Develop and apply their analytic, problem-solving, design, and computational thinking skills.
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