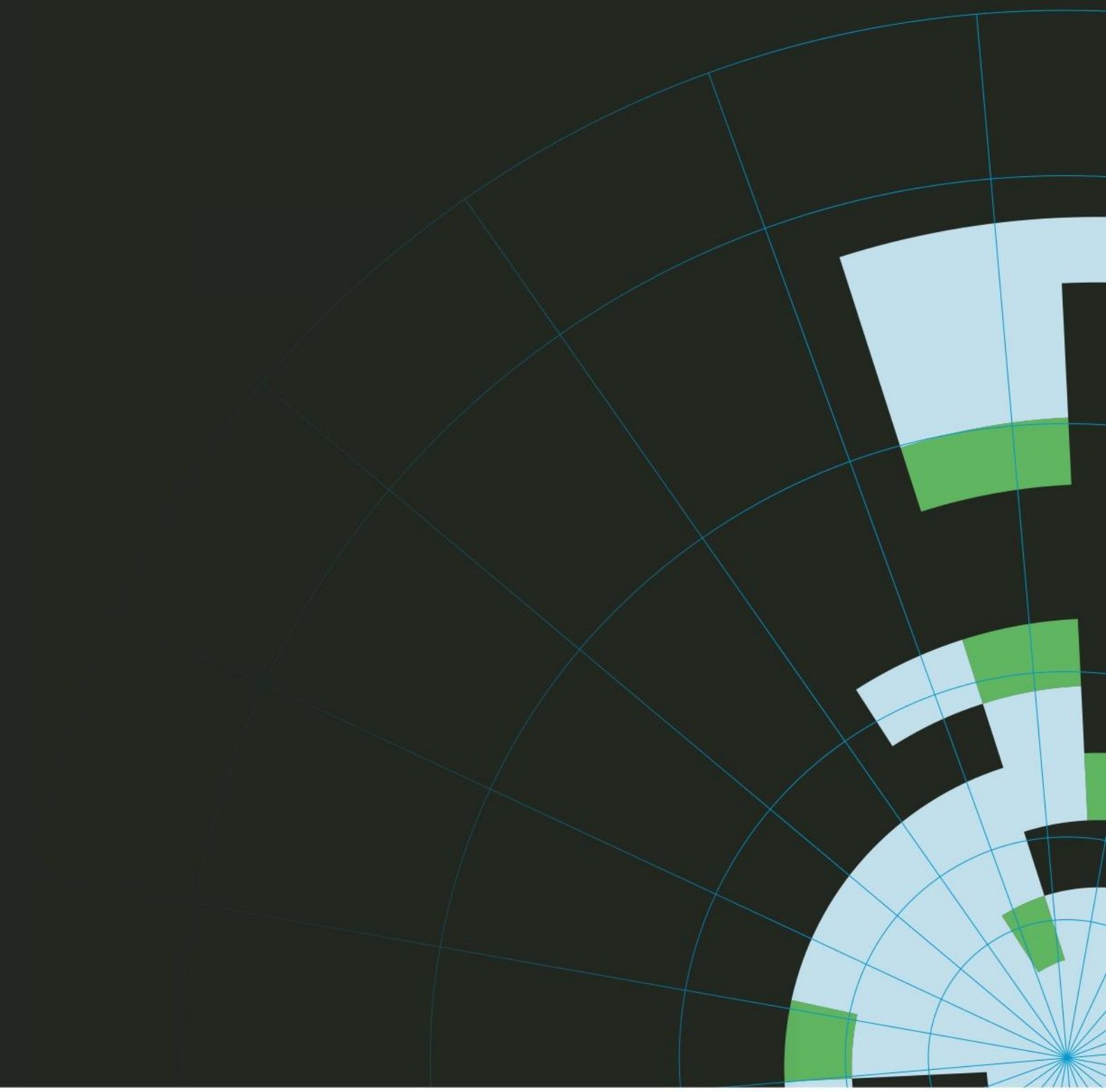
STATWARS®

CLIMATE CHANGE CHALLENGE



Primary Engineer Programmes
...the first step®

institution of Primary Engineers®
institution of Secondary Engineers®

SECONDARY ENGINEER®

Primary Engineer
LEADERS AWARD
Secondary Engineer
LEADERS AWARD

STATWARS®: Climate Change Challenge

National Curriculum Mapping Document

STATWARS® is an annual competition that has been developed by Primary Engineer Programmes.

For full terms and conditions of the STATWARS® competition please visit www.statwarscompetition.com for the current competition rules and regulations, as they will be subject to change.

STATWARS®: Climate Change Challenge

When we collect, analyse and contextualise data and information, we gain insight, understanding and the ability to make a difference.

The **STATWARS®: Climate Change Challenge** vision is to empower and educate pupils to tackle climate change, by providing a project that delivers meaningful and engaging mathematics, numeracy and data literacy to pupils!

We believe the data we collect can inform meaningful research and decision making, with its careful application revolutionising our understanding of how to manage the Climate Change Challenge ahead of us! We need young people to be a part of that journey…

How does STATWARS®: Climate Change Challenge work?

The STATWARS®: Climate Change Challenge asks pupils to use big and small datasets to identify 3 changes they can personally commit to in their daily lives that will lower their individual carbon footprint. Pupils work in small teams and will use their data skills to communicate their commitment to these changes, in the form of a manifesto!

The Challenge asks pupils to:

- Design and create a data driven infographic poster, which provides key information for how they came to their decision
- Design and create an advertisement poster/manifesto pledge, which is a creative element where pupils can explore ways of drawing attention to their ideas for change and encourage others to join them on their journey,
- Produce a 60-sec pitch to support their manifesto and encourage others to join them

In addition, the 3 commitments to change will each be submitted to a national database in order to support climate change research.

The beauty of this project is pupils are given the task of enacting legitimate change to their own actions, whilst encouraging the wider community with a data driven argument to follow their lead!

The competition's structure encourages pupils to apply mathematics not just creatively, but logically, to research, collect, analyse and present data, whilst drawing on their own personal experiences to support their climate change manifesto. The nature of the project encourages and develops meta-skills related to teamwork, leadership, curiosity, empathy, critical thinking and resilience, as teams are asked to consider indeterminate problems and develop data driven hypothesis. Teachers are provided with whole class differentiated resources, such as lesson plans and curriculum links to support delivery of this 6 week project.

Shortlisted teams will be invited to an awards and exhibition day to talk through their project with the judges.

So, get involved and help your pupils make a difference to the world we live in!

STATWARS® is an annual competition that has been developed by Primary Engineer Programmes.

For more information and how to enter, please visit https://www.statwarscompetition.com/

Developing Pupils Across the Curriculum

STATWARS® has clear links to the National Curriculum programme of study across **KS2-3**, such as **Mathematics, Science** and **Computing, thus preparing pupils for Key Stage 4 studies** and further education in these areas. These links draw on the need to offer a meaningful and engaging problem solving platform, which allows the cross curricular application of subject skills, knowledge and understanding. A main aim of STATWARS® is to promote an understanding of real world use of mathematics and science, allowing pupils to follow simple or complex lines of enquiry from start to finish. They will seek out patterns and relationships in order to present coherent, justified arguments that are based on thorough data collection and analysis. STATWARS® provides the foundations for understanding the world through the specific science disciplines, helping pupils develop essential aspects of knowledge and concepts, so that they can explain what is occurring in the world around them.

Mathematics and science are highly creative and interconnected disciplines, providing solutions to the most intriguing problems. STATWARS® allows pupils to make rich connections between different subjects, the world of work and their own learning, as they work through a topic that is meaningful, relevant and contemporary. This creates a sense of curiosity and enjoyment of these subjects, as pupils are required to consider the importance of statistical measurements in the past, present and future. Pupils can begin to see mathematics and science as wholly relevant skillsets, which can be applied throughout their whole life, thus potentially leading to multiple industry and societal benefits.

Pupils are also challenged to apply their mathematics imaginatively and logically to solve the problem, which involves breaking it down into a series of steps, each of which offer themselves to an increasing level of sophistication. The nature of the project encourages curiosity, criticality and resilience, as pupils are asked to consider indeterminate problems and develop data driven hypothesise. The competition is differentiated to allow pupils to work in groups, or independently as part of a team to solve those problems, through the support of a scaffolded project, as well as their peers.

STATWARS® challenges pupils to reason mathematically throughout their analysis and presentation of data and information collected, so that they can justify their 3 manifesto pledge choices. Pupils then deliver this information via a pitch, using two posters: one for advertisement, and one as an infographic. These creative elements of the competition allow pupils to present their data in numerous ways, with the goal of providing justification of decision. This use of scientific, mathematic and data focused spoken language develops pupils across the whole curriculum, cognitively, socially and linguistically. This contextualised development and application of mathematics and science leads to the increase in ability to apply those skills to other subjects and the wider world.

Many other National Curriculum areas are developed through STATWARS®, such as English; reading, writing, and spoken language, discussion, making formal presentations and participating in debate and Art & Design; exploring ideas, producing creative work and evaluation of design.

Contents

The following tables show how STATWARS® can be mapped to the English National Curriculum for Mathematics and Science:

KS2 Mathematics (Years 5-6)

Lesson	Description	Year	Specific Topic	Predicted Outcomes
1	Understanding the Problem and Your Own Carbon Footprint	5	Number - number and place value	read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
		5	Number - number and place value	solve number problems and practical problems
		5	Measurement	convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]
		5	Measurement	understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
		6	Number - addition, subtraction, multiplication and division	perform mental calculations, including with mixed operations and large numbers
		6	Number - addition, subtraction, multiplication and division	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
2	Planning and Collecting Data	5	Number - number and place value	read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
		5	Number - number and place value	round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000
		5	Number - number and place value	solve number problems and practical problems
		5	Number - addition and subtraction	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
		5	Number - multiplication and division	multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000

		5	Number - multiplication and division	solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
		5	Number - multiplication and division	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
		5	Measurement	convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]
		5	Measurement	use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
		5	Statistics	complete, read and interpret information in tables, including timetables
		6	Number - addition, subtraction, multiplication and division	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
		6	Ratio and proportion	solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison
		6	Algebra	use simple formulae
		6	Measurement	solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate
		6	Measurement	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places
3	Preparing Data & Descriptive Analysis	5	Number - number and place value	read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
		5	Number - number and place value	round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000
		5	Number - number and place value	solve number problems and practical problems
		5	Number - addition and subtraction	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)

		5	Number - addition and subtraction	add and subtract numbers mentally with increasingly large numbers
		5	Number - addition and subtraction	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
		5	Number - addition and subtraction	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
		5	Number - multiplication and division	multiply and divide numbers mentally, drawing upon known facts
		5	Number - multiplication and division	multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000
		5	Number - multiplication and division	solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
		5	Number - multiplication and division	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
		5	Number - multiplication and division	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
		5	Number - fractions (including decimals and percentages)	read and write decimal numbers as fractions [for example, 0.71 = 71/100]
		5	Number - fractions (including decimals and percentages)	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
		5	Number - fractions (including decimals and percentages)	round decimals with 2 decimal places to the nearest whole number and to 1 decimal place
		5	Number - fractions (including decimals and percentages)	read, write, order and compare numbers with up to 3 decimal places
		5	Number - fractions (including decimals and percentages)	solve problems involving number up to 3 decimal places

		5	Number - fractions (including decimals and percentages)	recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction
		5	Number - fractions (including decimals and percentages)	solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5, 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25
		5	Measurement	use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
		5	Statistics	solve comparison, sum and difference problems using information presented in a line graph
		5	Statistics	complete, read and interpret information in tables, including timetables
		6	Number - addition, subtraction, multiplication and division	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
		6	Number - addition, subtraction, multiplication and division	perform mental calculations, including with mixed operations and large numbers
		6	Number - addition, subtraction, multiplication and division	use their knowledge of the order of operations to carry out calculations involving the 4 operations
		6	Number - addition, subtraction, multiplication and division	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
		6	Number - addition, subtraction, multiplication and division	solve problems involving addition, subtraction, multiplication and division

		6	Number - addition, subtraction, multiplication and division	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
		6	Number - Fractions (including decimals and percentages)	identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places
		6	Number - Fractions (including decimals and percentages)	solve problems which require answers to be rounded to specified degrees of accuracy
		6	Algebra	use simple formulae
		6	Measurement	solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate
		6	Measurement	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places
		6	Statistics	interpret and construct pie charts and line graphs and use these to solve problems
4	Predictive Analysis and Creating Your Infographic	5	Number - number and place value	read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
		5	Number - number and place value	round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000
		5	Number - number and place value	solve number problems and practical problems
		5	Number - addition and subtraction	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
		5	Number - addition and subtraction	add and subtract numbers mentally with increasingly large numbers
		5	Number - addition and subtraction	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
		5	Number - addition and subtraction	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

		5	Number - multiplication and division	multiply and divide numbers mentally, drawing upon known facts
		5	Number - multiplication and division	multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000
		5	Number - multiplication and division	solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
		5	Number - multiplication and division	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
		5	Number - fractions (including decimals and percentages)	read and write decimal numbers as fractions [for example, 0.71 = 71/100]
		5	Number - fractions (including decimals and percentages)	round decimals with 2 decimal places to the nearest whole number and to 1 decimal place
		5	Number - fractions (including decimals and percentages)	read, write, order and compare numbers with up to 3 decimal places
		5	Number - fractions (including decimals and percentages)	solve problems involving number up to 3 decimal places
		5	Number - fractions (including decimals and percentages)	recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction
		5	Measurement	convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]
		5	Measurement	use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
		5	Statistics	solve comparison, sum and difference problems using information presented in a line graph
		5	Statistics	complete, read and interpret information in tables, including timetables

		6	Number - addition, subtraction, multiplication and division	perform mental calculations, including with mixed operations and large numbers
		6	Number - addition, subtraction, multiplication and division	use their knowledge of the order of operations to carry out calculations involving the 4 operations
		6	Number - addition, subtraction, multiplication and division	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
		6	Number - addition, subtraction, multiplication and division	solve problems involving addition, subtraction, multiplication and division
		6	Number - addition, subtraction, multiplication and division	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
		6	Number - Fractions (including decimals and percentages)	solve problems which require answers to be rounded to specified degrees of accuracy
		6	Ratio and proportion	solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison
		6	Algebra	use simple formulae
		6	Algebra	enumerate possibilities of combinations of 2 variables
		6	Measurement	solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate
		6	Measurement	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places

		6	Measurement	calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]
		6	Statistics	interpret and construct pie charts and line graphs and use these to solve problems
5	Creating Your Advertising Poster	5	Measurement	convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]
		5	Geometry - properties of shapes	identify 3-D shapes, including cubes and other cuboids, from 2-D representations
		5	Geometry - properties of shapes	draw given angles, and measure them in degrees (°)
		5	Geometry - properties of shapes	identify: use the properties of rectangles to deduce related facts and find missing lengths and angles
		5	Geometry - properties of shapes	identify: distinguish between regular and irregular polygons based on reasoning about equal sides and angles
		5	Geometry - position and direction	identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed
		6	Measurement	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places
		6	Measurement	recognise that shapes with the same areas can have different perimeters and vice versa
		6	Measurement	calculate the area of parallelograms and triangles
		6	Measurement	calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]
		6	Geometry - properties of shapes	draw 2-D shapes using given dimensions and angles
		6	Geometry - properties of shapes	recognise, describe and build simple 3-D shapes, including making nets

		6	Geometry - properties of shapes	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
		6	Geometry - properties of shapes	illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
6	Presenting and Implementing	5	Statistics	complete, read and interpret information in tables, including timetables
		6	Measurement	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places

STATWARS® KS2 Mathematics (5-6) Summary of Outcomes

Summary of KS2/3 Maths Outcomes		
Year	**Specific Topic**	**Predicted Outcomes**
5	Geometry - position and direction	identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed
5	Geometry - properties of shapes	identify 3-D shapes, including cubes and other cuboids, from 2-D representations
5	Geometry - properties of shapes	draw given angles, and measure them in degrees (°)
5	Geometry - properties of shapes	identify: use the properties of rectangles to deduce related facts and find missing lengths and angles
5	Geometry - properties of shapes	identify: distinguish between regular and irregular polygons based on reasoning about equal sides and angles
5	Measurement	convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]
5	Measurement	understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
5	Measurement	use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
5	Number - addition and subtraction	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
5	Number - addition and subtraction	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
5	Number - addition and subtraction	add and subtract numbers mentally with increasingly large numbers
5	Number - addition and subtraction	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

5	Number - fractions (including decimals and percentages)	read and write decimal numbers as fractions [for example, 0.71 = 71/100]
5	Number - fractions (including decimals and percentages)	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
5	Number - fractions (including decimals and percentages)	round decimals with 2 decimal places to the nearest whole number and to 1 decimal place
5	Number - fractions (including decimals and percentages)	read, write, order and compare numbers with up to 3 decimal places
5	Number - fractions (including decimals and percentages)	solve problems involving number up to 3 decimal places
5	Number - fractions (including decimals and percentages)	recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction
5	Number - fractions (including decimals and percentages)	solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5, 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25
5	Number - multiplication and division	multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000
5	Number - multiplication and division	solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
5	Number - multiplication and division	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
5	Number - multiplication and division	multiply and divide numbers mentally, drawing upon known facts
5	Number - multiplication and division	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

5	Number - number and place value	read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
5	Number - number and place value	solve number problems and practical problems
5	Number - number and place value	round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000
5	Statistics	complete, read and interpret information in tables, including timetables
5	Statistics	solve comparison, sum and difference problems using information presented in a line graph
6	Algebra	use simple formulae
6	Algebra	enumerate possibilities of combinations of 2 variables
6	Geometry - properties of shapes	draw 2-D shapes using given dimensions and angles
6	Geometry - properties of shapes	recognise, describe and build simple 3-D shapes, including making nets
6	Geometry - properties of shapes	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
6	Geometry - properties of shapes	illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
6	Geometry - properties of shapes	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
6	Measurement	solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate
6	Measurement	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places
6	Measurement	calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]
6	Measurement	recognise that shapes with the same areas can have different perimeters and vice versa
6	Measurement	calculate the area of parallelograms and triangles

6	Number - addition, subtraction, multiplication and division	perform mental calculations, including with mixed operations and large numbers
6	Number - addition, subtraction, multiplication and division	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
6	Number - addition, subtraction, multiplication and division	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
6	Number - addition, subtraction, multiplication and division	use their knowledge of the order of operations to carry out calculations involving the 4 operations
6	Number - addition, subtraction, multiplication and division	solve problems involving addition, subtraction, multiplication and division
6	Number - Fractions (including decimals and percentages)	solve problems which require answers to be rounded to specified degrees of accuracy
6	Number - Fractions (including decimals and percentages)	identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places
6	Ratio and proportion	solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison
6	Statistics	interpret and construct pie charts and line graphs and use these to solve problems
6	Statistics	calculate and interpret the mean as an average

KS2 Science

Lesson	Description	Year	Specific Topic	Predicted Outcomes
1	Understanding the Problem and Your Own Carbon Footprint	5	Properties and changes of materials	use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
		5	Properties and changes of materials	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
		6	Living things and their habitats	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
		6	Living things and their habitats	give reasons for classifying plants and animals based on specific characteristics
		6	Evolution and inheritance	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
2	Planning and Collecting Data	5	Properties and changes of materials	use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
		5	Properties and changes of materials	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
		6	Living things and their habitats	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
		6	Evolution and inheritance	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
3	Preparing Data & Descriptive Analysis	5	Properties and changes of materials	use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
		5	Properties and changes of materials	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

		6	Living things and their habitats	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
		6	Evolution and inheritance	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
4	Predictive Analysis and Creating Your Infographic	5	Properties and changes of materials	use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
		5	Properties and changes of materials	give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
		5	Properties and changes of materials	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
		6	Living things and their habitats	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
		6	Evolution and inheritance	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
5	Creating Your Advertising Poster	5	Properties and changes of materials	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
		6	Evolution and inheritance	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
6	Presenting and Implementing	5	Properties and changes of materials	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
		6	Evolution and inheritance	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

STATWARS® KS2 Science Summary of Outcomes

Year	Specific Topic	Predicted Outcomes
5	Properties and changes of materials	use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
5	Properties and changes of materials	explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
5	Properties and changes of materials	give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
6	Evolution and inheritance	identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
6	Living things and their habitats	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
6	Living things and their habitats	give reasons for classifying plants and animals based on specific characteristics

KS3 Mathematics

Lesson	Description	Year	Specific Topic	Predicted Outcomes
1	Understanding the Problem and Your Own Carbon Footprint	7-9	Reason mathematically	begin to reason deductively in geometry, number and algebra, including using geometrical constructions
		7-9	Reason mathematically	interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning
		7-9	Reason mathematically	explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally
		7-9	Number	use standard units of mass, length, time, money and other measures, including with decimal quantities
		7-9	Number	round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
		7-9	Number	use a calculator and other technologies to calculate results accurately and then interpret them appropriately
		7-9	Ratio, proportion and rates of change	change freely between related standard units [for example time, length, area, volume/capacity, mass]
		7-9	Statistics	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)
2	Planning and Collecting Data	7-9	Develop fluency	select and use appropriate calculation strategies to solve increasingly complex problems
		7-9	Develop fluency	move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]
		7-9	Reason mathematically	extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations

		7-9	Reason mathematically	identify variables and express relations between variables algebraically and graphically
		7-9	Reason mathematically	begin to reason deductively in geometry, number and algebra, including using geometrical constructions
		7-9	Reason mathematically	explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally
		7-9	Solve problems	begin to model situations mathematically and express the results using a range of formal mathematical representations
		7-9	Number	understand and use place value for decimals, measures and integers of any size
		7-9	Number	use standard units of mass, length, time, money and other measures, including with decimal quantities
		7-9	Number	round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
		7-9	Number	use a calculator and other technologies to calculate results accurately and then interpret them appropriately
		7-9	Algebra	interpret mathematical relationships both algebraically and graphically
		7-9	Algebra	find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs
		7-9	Ratio, proportion and rates of change	change freely between related standard units [for example time, length, area, volume/capacity, mass]
		7-9	Ratio, proportion and rates of change	solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics
		7-9	Probability	record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale

		7-9	Statistics	construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data
4	Predictive Analysis and Creating Your Infographic	7-9	Develop fluency	select and use appropriate calculation strategies to solve increasingly complex problems
		7-9	Develop fluency	move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]
		7-9	Reason mathematically	extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations
		7-9	Reason mathematically	identify variables and express relations between variables algebraically and graphically
		7-9	Reason mathematically	make and test conjectures about patterns and relationships; look for proofs or counter-examples
		7-9	Reason mathematically	begin to reason deductively in geometry, number and algebra, including using geometrical constructions
		7-9	Reason mathematically	interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning
		7-9	Reason mathematically	explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally
		7-9	Solve problems	develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems
		7-9	Solve problems	develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics
		7-9	Solve problems	begin to model situations mathematically and express the results using a range of formal mathematical representations
		7-9	Solve problems	select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems
		7-9	Number	understand and use place value for decimals, measures and integers of any size

		7-9	Number	use standard units of mass, length, time, money and other measures, including with decimal quantities
		7-9	Number	round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
		7-9	Number	use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$
		7-9	Number	use a calculator and other technologies to calculate results accurately and then interpret them appropriately
		7-9	Algebra	model situations or procedures by translating them into algebraic expressions or formulae and by using graphs
		7-9	Algebra	interpret mathematical relationships both algebraically and graphically
		7-9	Algebra	find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs
		7-9	Ratio, proportion and rates of change	solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics
		7-9	Ratio, proportion and rates of change	solve problems involving direct and inverse proportion, including graphical and algebraic representations
		7-9	Probability	record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale
		7-9	Statistics	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)
		7-9	Statistics	construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data

		7-9	Statistics	describe simple mathematical relationships between 2 variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs
5	Creating Your Advertising Poster	7-9	Ratio, proportion and rates of change	change freely between related standard units [for example time, length, area, volume/capacity, mass]
		7-9	Ratio, proportion and rates of change	use scale factors, scale diagrams and maps
		7-9	Geometry and measures	derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders)
		7-9	Geometry and measures	calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes
		7-9	Geometry and measures	draw and measure line segments and angles in geometric figures, including interpreting scale drawings
		7-9	Geometry and measures	derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line
		7-9	Geometry and measures	describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric
6	Presenting and Implementing	7-9	Develop fluency	use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics
		7-9	Reason mathematically	begin to reason deductively in geometry, number and algebra, including using geometrical constructions
		7-9	Reason mathematically	explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally
		7-9	Number	use standard units of mass, length, time, money and other measures, including with decimal quantities
		7-9	Algebra	interpret mathematical relationships both algebraically and graphically

		7-9	Geometry and measures	describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric
		7-9	Geometry and measures	interpret mathematical relationships both algebraically and geometrically
		7-9	Probability	record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale
		7-9	Statistics	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)
		7-9	Statistics	construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data
		7-9	Statistics	describe simple mathematical relationships between 2 variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs

STATWARS® KS3 Mathematics (7-9) Summary of Outcomes

Year	Specific Topic	Predicted Outcomes
7-9	Algebra	interpret mathematical relationships both algebraically and graphically
7-9	Algebra	find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs
7-9	Algebra	recognise, sketch and produce graphs of linear and quadratic functions of 1 variable with appropriate scaling, using equations in x and y and the Cartesian plane
7-9	Algebra	model situations or procedures by translating them into algebraic expressions or formulae and by using graphs
7-9	Develop fluency	select and use appropriate calculation strategies to solve increasingly complex problems
7-9	Develop fluency	move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]
7-9	Develop fluency	consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots
7-9	Develop fluency	use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics
7-9	Geometry and measures	derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders)
7-9	Geometry and measures	calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes
7-9	Geometry and measures	draw and measure line segments and angles in geometric figures, including interpreting scale drawings

7-9	Geometry and measures	derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line
7-9	Geometry and measures	describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric
7-9	Geometry and measures	interpret mathematical relationships both algebraically and geometrically
7-9	Number	use standard units of mass, length, time, money and other measures, including with decimal quantities
7-9	Number	round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
7-9	Number	use a calculator and other technologies to calculate results accurately and then interpret them appropriately
7-9	Number	understand and use place value for decimals, measures and integers of any size
7-9	Number	define percentage as ‘number of parts per hundred’, interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%
7-9	Number	interpret fractions and percentages as operators
7-9	Number	use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$
7-9	Probability	record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale
7-9	Probability	understand that the probabilities of all possible outcomes sum to 1
7-9	Ratio, proportion and rates of change	change freely between related standard units [for example time, length, area, volume/capacity, mass]

7-9	Ratio, proportion and rates of change	solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics
7-9	Ratio, proportion and rates of change	understand that a multiplicative relationship between 2 quantities can be expressed as a ratio or a fraction
7-9	Ratio, proportion and rates of change	solve problems involving direct and inverse proportion, including graphical and algebraic representations
7-9	Ratio, proportion and rates of change	use scale factors, scale diagrams and maps
7-9	Reason mathematically	begin to reason deductively in geometry, number and algebra, including using geometrical constructions
7-9	Reason mathematically	interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning
7-9	Reason mathematically	explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally
7-9	Reason mathematically	extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations
7-9	Reason mathematically	identify variables and express relations between variables algebraically and graphically
7-9	Reason mathematically	make and test conjectures about patterns and relationships; look for proofs or counter-examples
7-9	Solve problems	begin to model situations mathematically and express the results using a range of formal mathematical representations
7-9	Solve problems	develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems
7-9	Solve problems	develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics
7-9	Solve problems	select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems
7-9	Statistics	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)

7-9	Statistics	construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data
7-9	Statistics	describe simple mathematical relationships between 2 variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs

KS3 Science

Lesson	Description	Year	Specific Topic	Predicted Outcomes
1	Understanding the Problem and Your Own Carbon Footprint	7-9	Biology - Material cycles and energy - Photosynthesis	the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
		7-9	Biology - Material cycles and energy - Cellular respiration	aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the importance of plant reproduction through insect pollination in human food security
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
		7-9	Biology - Genetics and evolution-Inheritance, chromosomes, DNA and genes	changes in the environment which 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
		7-9	Biology - Genetics and evolution-Inheritance, chromosomes, DNA and genes	the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material
		7-9	Chemistry - The particulate nature of matter	the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
		7-9	Chemistry - Earth and atmosphere	the composition of the Earth

		7-9	Chemistry - Earth and atmosphere	the structure of the Earth
		7-9	Chemistry - Earth and atmosphere	Earth as a source of limited resources and the efficacy of recycling
		7-9	Chemistry - Earth and atmosphere	the composition of the atmosphere
		7-9	Chemistry - Earth and atmosphere	the production of carbon dioxide by human activity and the impact on climate
2	Planning and Collecting Data	7-9	Experimental skills and investigations	ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
		7-9	Experimental skills and investigations	make predictions using scientific knowledge and understanding
		7-9	Experimental skills and investigations	make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements
		7-9	Analysis and evaluation	apply mathematical concepts and calculate results
		7-9	Analysis and evaluation	present observations and data using appropriate methods, including tables and graphs
		7-9	Analysis and evaluation	interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
		7-9	Analysis and evaluation	present reasoned explanations, including explaining data in relation to predictions and hypotheses
		7-9	Analysis and evaluation	evaluate data, showing awareness of potential sources of random and systematic error
		7-9	Analysis and evaluation	identify further questions arising from their results
		7-9	Measurement	undertake basic data analysis including simple statistical techniques
		7-9	Biology - Material cycles and energy - Photosynthesis	the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
		7-9	Biology - Material cycles and energy - Cellular respiration	aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life

		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the importance of plant reproduction through insect pollination in human food security
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
		7-9	Biology - Genetics and evolution-Inheritance, chromosomes, DNA and genes	changes in the environment which 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
		7-9	Chemistry - The particulate nature of matter	the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
		7-9	Chemistry - Earth and atmosphere	the composition of the Earth
		7-9	Chemistry - Earth and atmosphere	the structure of the Earth
		7-9	Chemistry - Earth and atmosphere	Earth as a source of limited resources and the efficacy of recycling
		7-9	Chemistry - Earth and atmosphere	the composition of the atmosphere
		7-9	Chemistry - Earth and atmosphere	the production of carbon dioxide by human activity and the impact on climate
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing energy values of different foods (from labels) (kJ)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing power ratings of appliances in watts (W, kW)

		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing amounts of energy transferred (J, kJ, kW hour)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	domestic fuel bills, fuel use and costs
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	fuels and energy resources
3	Preparing Data & Descriptive Analysis	7-9	Experimental skills and investigations	ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
		7-9	Experimental skills and investigations	make predictions using scientific knowledge and understanding
		7-9	Experimental skills and investigations	select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables
		7-9	Experimental skills and investigations	make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements
		7-9	Experimental skills and investigations	apply sampling techniques
		7-9	Analysis and evaluation	apply mathematical concepts and calculate results
		7-9	Analysis and evaluation	present observations and data using appropriate methods, including tables and graphs
		7-9	Analysis and evaluation	interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
		7-9	Analysis and evaluation	present reasoned explanations, including explaining data in relation to predictions and hypotheses
		7-9	Analysis and evaluation	evaluate data, showing awareness of potential sources of random and systematic error
		7-9	Analysis and evaluation	identify further questions arising from their results
		7-9	Measurement	undertake basic data analysis including simple statistical techniques

		7-9	Biology - Material cycles and energy - Photosynthesis	the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
		7-9	Biology - Material cycles and energy - Cellular respiration	aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the importance of plant reproduction through insect pollination in human food security
		7-9	Biology - Genetics and evolution-Inheritance, chromosomes, DNA and genes	changes in the environment which 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
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
		7-9	Chemistry - The particulate nature of matter	the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
		7-9	Chemistry - Earth and atmosphere	the composition of the Earth
		7-9	Chemistry - Earth and atmosphere	the structure of the Earth
		7-9	Chemistry - Earth and atmosphere	Earth as a source of limited resources and the efficacy of recycling
		7-9	Chemistry - Earth and atmosphere	the composition of the atmosphere
		7-9	Chemistry - Earth and atmosphere	the production of carbon dioxide by human activity and the impact on climate

		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing energy values of different foods (from labels) (kJ)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing power ratings of appliances in watts (W, kW)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing amounts of energy transferred (J, kJ, kW hour)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	domestic fuel bills, fuel use and costs
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	fuels and energy resources
4	Predictive Analysis and Creating Your Infographic	7-9	Scientific attitudes	pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility
		7-9	Experimental skills and investigations	ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
		7-9	Experimental skills and investigations	make predictions using scientific knowledge and understanding
		7-9	Experimental skills and investigations	select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables
		7-9	Experimental skills and investigations	make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements
		7-9	Experimental skills and investigations	apply sampling techniques
		7-9	Analysis and evaluation	apply mathematical concepts and calculate results
		7-9	Analysis and evaluation	present observations and data using appropriate methods, including tables and graphs

		7-9	Analysis and evaluation	interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
		7-9	Analysis and evaluation	present reasoned explanations, including explaining data in relation to predictions and hypotheses
		7-9	Analysis and evaluation	evaluate data, showing awareness of potential sources of random and systematic error
		7-9	Analysis and evaluation	identify further questions arising from their results
		7-9	Measurement	undertake basic data analysis including simple statistical techniques
		7-9	Biology - Material cycles and energy - Photosynthesis	the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
		7-9	Biology - Material cycles and energy - Cellular respiration	aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the importance of plant reproduction through insect pollination in human food security
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
		7-9	Biology - Genetics and evolution-Inheritance, chromosomes, DNA and genes	changes in the environment which 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
		7-9	Chemistry - The particulate nature of matter	the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
		7-9	Chemistry - Earth and atmosphere	the composition of the Earth
		7-9	Chemistry - Earth and atmosphere	the structure of the Earth

		7-9	Chemistry - Earth and atmosphere	Earth as a source of limited resources and the efficacy of recycling
		7-9	Chemistry - Earth and atmosphere	the composition of the atmosphere
		7-9	Chemistry - Earth and atmosphere	the production of carbon dioxide by human activity and the impact on climate
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing energy values of different foods (from labels) (kJ)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing power ratings of appliances in watts (W, kW)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing amounts of energy transferred (J, kJ, kW hour)
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	domestic fuel bills, fuel use and costs
		7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	fuels and energy resources
		7-9	Physics - Energy - Changes in systems	energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change
5	Creating Your Advertising Poster	7-9	Experimental skills and investigations	ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
		7-9	Experimental skills and investigations	make predictions using scientific knowledge and understanding
		7-9	Analysis and evaluation	interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
		7-9	Analysis and evaluation	present reasoned explanations, including explaining data in relation to predictions and hypotheses

		7-9	Biology - Material cycles and energy - Photosynthesis	the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
		7-9	Biology - Material cycles and energy - Cellular respiration	aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the importance of plant reproduction through insect pollination in human food security
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
		7-9	Biology - Genetics and evolution-Inheritance, chromosomes, DNA and genes	changes in the environment which 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
		7-9	Chemistry - The particulate nature of matter	the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
		7-9	Chemistry - Earth and atmosphere	the composition of the Earth
		7-9	Chemistry - Earth and atmosphere	the structure of the Earth
		7-9	Chemistry - Earth and atmosphere	Earth as a source of limited resources and the efficacy of recycling
		7-9	Chemistry - Earth and atmosphere	the composition of the atmosphere
		7-9	Chemistry - Earth and atmosphere	the production of carbon dioxide by human activity and the impact on climate
6	Presenting and Implementing	7-9	Experimental skills and investigations	ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience

		7-9	Experimental skills and investigations	make predictions using scientific knowledge and understanding
		7-9	Analysis and evaluation	apply mathematical concepts and calculate results
		7-9	Analysis and evaluation	present observations and data using appropriate methods, including tables and graphs
		7-9	Analysis and evaluation	interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
		7-9	Analysis and evaluation	present reasoned explanations, including explaining data in relation to predictions and hypotheses
		7-9	Analysis and evaluation	evaluate data, showing awareness of potential sources of random and systematic error
		7-9	Analysis and evaluation	identify further questions arising from their results
		7-9	Biology - Material cycles and energy - Photosynthesis	the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
		7-9	Biology - Material cycles and energy - Cellular respiration	aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the importance of plant reproduction through insect pollination in human food security
		7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
		7-9	Biology - Genetics and evolution-Inheritance, chromosomes, DNA and genes	changes in the environment which 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
		7-9	Chemistry - The particulate nature of matter	the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure

		7-9	Chemistry - Earth and atmosphere	the composition of the Earth
		7-9	Chemistry - Earth and atmosphere	the structure of the Earth
		7-9	Chemistry - Earth and atmosphere	Earth as a source of limited resources and the efficacy of recycling
		7-9	Chemistry - Earth and atmosphere	the composition of the atmosphere
		7-9	Chemistry - Earth and atmosphere	the production of carbon dioxide by human activity and the impact on climate

STATWARS® KS3 Science Summary of Outcomes

Year	Specific Topic	Predicted Outcomes
7-9	Analysis and evaluation	apply mathematical concepts and calculate results
7-9	Analysis and evaluation	present observations and data using appropriate methods, including tables and graphs
7-9	Analysis and evaluation	interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
7-9	Analysis and evaluation	present reasoned explanations, including explaining data in relation to predictions and hypotheses
7-9	Analysis and evaluation	evaluate data, showing awareness of potential sources of random and systematic error
7-9	Analysis and evaluation	identify further questions arising from their results
7-9	Biology - Genetics and evolution- Inheritance, chromosomes, DNA and genes	changes in the environment which 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
7-9	Biology - Genetics and evolution- Inheritance, chromosomes, DNA and genes	the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material
7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops

7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	the importance of plant reproduction through insect pollination in human food security
7-9	Biology - Interactions and interdependencies - Relationships in an ecosystem	how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
7-9	Biology - Material cycles and energy - Cellular respiration	aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
7-9	Biology - Material cycles and energy - Photosynthesis	the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
7-9	Chemistry - Earth and atmosphere	the composition of the Earth
7-9	Chemistry - Earth and atmosphere	the structure of the Earth
7-9	Chemistry - Earth and atmosphere	Earth as a source of limited resources and the efficacy of recycling
7-9	Chemistry - Earth and atmosphere	the composition of the atmosphere
7-9	Chemistry - Earth and atmosphere	the production of carbon dioxide by human activity and the impact on climate
7-9	Chemistry - The particulate nature of matter	the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
7-9	Experimental skills and investigations	ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
7-9	Experimental skills and investigations	make predictions using scientific knowledge and understanding
7-9	Experimental skills and investigations	make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements
7-9	Experimental skills and investigations	select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables
7-9	Experimental skills and investigations	apply sampling techniques
7-9	Measurement	undertake basic data analysis including simple statistical techniques
7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing energy values of different foods (from labels) (kJ)

7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing power ratings of appliances in watts (W, kW)
7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	comparing amounts of energy transferred (J, kJ, kW hour)
7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	domestic fuel bills, fuel use and costs
7-9	Physics - Energy - Calculation of fuel uses and costs in the domestic context	fuels and energy resources
7-9	Physics - Energy - Changes in systems	energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change
7-9	Scientific attitudes	pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility