The St Michael Steiner School

High School Course Directory

English Eurythmy Independent **Projects** Languages **Mathematics** Natural Sciences Performing Arts Social Sciences Physical Education Studio Arts & Crafts Student Exchanges Student Welfare Assessment & Certification Higher Education



2024/2025



INTRODUCTION

The High School programme is designed to give the students a foundation in a broad range of subjects, to develop practical and study skills and to encourage initiative and independence in learning and in life.

The timetable is organised approximately in two 2-hour periods, each morning, with the intention that most subjects are taught in intensive blocks that change every 3 - 5 weeks. Afternoons are used for weekly P.E., choir, orchestra, and Art and Craft lessons, and sometimes to extend the morning lessons.

In order to keep the curriculum broad, in Classes 9 and 10, there is a course of compulsory modules for all students throughout the year.

Midway through Class 10, and then again in Class 11, students are consulted about their wishes and plans for the future. We refer to what they tell us, as well as our own knowledge and experience, in our planning for Classes 11 & 12.

There is a core of compulsory Main Lessons that continue throughout the High School, but also an increasing number of elective blocks, beginning in Class 11 and especially in Class 12, so that students can give more time to their areas of particular interest.

In Classes 10, 11 & 12, we offer assessment and certification through the Certificate of Steiner Education (CSE) at levels 1, 2 and 3. Details of the structure, requirements, grading system and validity of the certificate are at the end of this directory, <u>here</u>.

In Classes 10, 11 and 12 students must take at least one subject from each of the core assessment areas at each level: six at levels 1 and 2; four at level 3.

In Class 12, the students must choose 3 areas of particular specialisation in addition to the four compulsory core areas, and also undertake a major personal project.

In Class 9, and sometimes in 10, student exchanges take place for those interested in improving their Spanish, French or German. Students from other countries also often visit and study with us for periods of up to a term at a time.

Below are details of the courses in various subjects and disciplines that are offered in the High School. Entries are colour-coded: Those in red are for Class 9; Class 10 blocks are purple; Class 11 blocks are green; Class 12's are blue.

The programme for each year depends on demand, space, individual students' needs, curriculum development, facilities and availability of staff. Details are updated as more information becomes available and are subject to change.

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MATHEMATICS

Class 9

Rhythms, Patterns and Sequences in Number: Roy Allen

This Main Lesson is a journey of discovery and development. Beginning in the geometry of the ancient mathematical form of the Vesica Piscis and using proportions of Pythagorean triangles the square roots of 2, 3 and 5 are investigated, the significance of $\sqrt{5}$ in Pentagonal Geometry is shown and the Golden Mean is defined. The Fibonacci sequence is investigated, identified in plant and animal forms and seen to converge to the Golden Mean.

Pascal's Triangle is constructed arithmetically and a sample of its many sequences, rhythms and patterns revealed. Permutations and combinations are defined from simple sorting and grouping problems and applied to the solution of complex sorting problems. Pascal's Triangle is reconstructed using combinations. Binomial expressions are defined and expanded and are shown to fit the rhythms and patterns of Pascal's Triangle. The infinite array of expanded binomial expressions and combinations in Pascal's Triangle are then condensed to a single statement which, which in future studies is further refined and developed to become the statement of the Binomial Theorem, which may then be applied to the extraction of roots of numbers and the solution of higher order equations.

By putting mathematics into an historical context and tracing the threads in a developing tapestry of connections and relationships we enter a world of deepening abstractions. Here the subject becomes more than the conventional learning and application of principles, methods and techniques: it is through the identification and development of the rhythms of number patterns that students develop an intuitive grasp of processes, principles and concepts that lead to and support a deeper intellectual understanding.

The Geometry of Conic Sections: Roy Allen

The four conic curves: circle, ellipse, hyperbola and parabola, are first obtained by modelling and cutting clay cones, geometric developments of truncated cones are then constructed and assembled to give the four conic curves. Using a variety of geometric methods employing the principles of plane and solid geometry the conic curves are constructed and their properties investigated. Eccentricity is discussed and the relationships between the different curves explored.

Class 10

Algebra: Roy Allen

The Algebra block explores algebraic principles, processes and methods and applies them to solving a wide range of algebraic and graphical problems. Simple linear equations will be solved and more complicated linear equations, including algebraic fractions, will be simplified and solved. Regions and inequalities will be investigated. Second order, quadratic, equations will be solved by a variety of methods. Equations with two unknowns will be solved. The properties of algebraic graphs will be investigated and the relationship between graphs and equations explored. Equations of graphs will be established and graphs of linear and quadratic equations will be drawn.

Trigonometry: Roy Allen

Trigonometry, from Greek *trigōnon* triangle + *metron* measure, is a branch of mathematics that deals with triangles. Whereas Pythagoras' Theorem describes the relationships between the sides of right-angled triangles, trigonometry deals with relationships between the sides and the angles of triangles and the functions that describe them. The Main Lesson will investigate the development and application of the fundamental principles of Trigonometry. The Theorem of Pythagoras will be reviewed and the Sine, Cosine, Tangent and Cotangent ratios for angles between 0° and 90° described and defined from investigations of the properties of right-angled triangles. Examination of the characteristic graphs of the Sine, Cosine, Tangent and Cotangent functions, generated from circles, will show how the trigonometric ratios change to accommodate angles greater than 90°. The treatment of non-right-angled triangles will be approached through the Sine and Cosine Rules which will be proved.

Surveying: Roy Allen

A week-long intensive, supplementary to the Trigonometry block. The Surveying week is a practical application of topics covered in the Trigonometry Main Lesson. Students will describe the surveying instruments; explain how they are used and demonstrate their use in measuring distances and horizontal angles (levelling may be included if time allows) to define the boundaries and topography of their allotted area of land. Triangulation will be used to transfer distances and angles onto a scaled map.

Class 11

Trigonometry: Roy Allen

Building on the Class X Trigonometry Main Lesson the course in Class XI begins an exploration of the properties of trigonometric functions. The derivations of the Sine Rule, the Sine Rule for calculating area, and the Cosine Rule are revised and the rules applied to solving triangle problems. Pythagorean Identities are introduced, proved and applied to solving trigonometric equations. Graphs of trigonometric functions are sketched and plotted.

Projective Geometry: Roy Allen

Projective geometry is not a study of geometry in the Euclidean sense – it is not quantitative, but qualitative and works with geometrical metamorphosis – the processes and relationships between geometrical entities where one form changes to another without losing its identity. "The important thing [about projective geometry] is the quality of its forms of thought". We are required to break free from the constraints and conditioning of Euclidean geometry and find new relationships to familiar geometric forms. Rethinking the ideas of point, line and plane, of parallelism and the infinite leads to the discovery that projective geometry embraces all geometries and that the principles of Euclidean geometry exist as special cases of projective geometry forms, Euclidean geometry is but a single thread in the all-embracing tapestry of projective geometry. This course explores the development of projective geometry and questions about planes, lines and points in relation to infinity and to the natural world, philosophy and sacred geometry. The principle of Duality is illustrated through the theorems of Pappus and Desargues. Pascal's and Brianchon's Theorems will be used to prove conic curves and to further develop the idea of duality. Ellipses are constructed using perspective and projective transformations. Nets of hexagons, nets of guadrangles and sequences of perspective triangles are constructed to demonstrate transformation of form.

The Calculus: Roy Allen

In the Calculus block in Class XI students embark upon a journey into the infinitesimal in mathematics. Functions will be defined and their properties explored. The gradient of straight lines leads to an investigation of the gradient of curves from which the first derivative of polynomial functions is defined and shown to give the gradient equation of the curve. Maximum and minimum points and points of inflection of curves are defined and graphs plotted using first differentials to determine the coordinates of maximum and minimum points and second differentials to distinguish between them. The equations of tangents and normals to points on polynomial curves are formulated and rates of change investigated. The Product and Quotient Rules are derived and used to differentiate combinations of functions. The integral is defined as the inverse of the differential – establishing the function from its aradient equation. The definite integral is derived and used to calculate the area under a curve and the area between two curves and solids of revolution generated by rotating the curve.

Class 12

Trigonometry: Roy Allen

Trigonometry in Class XII investigates the properties of compound angles, delves deeper into the properties of trigonometric functions and explores inverse trigonometric functions. Compound angle formulae – the addition and product formulae and their special cases the double and half angle formulae – are derived and the sum or difference of two trig functions is expressed as a single tria function. These relationships are applied to solve a range of trigonometric equations and to obtain general solutions to trigonometric equations. The properties of inverse trigonometric functions are explored and applied to solving triangle problems.

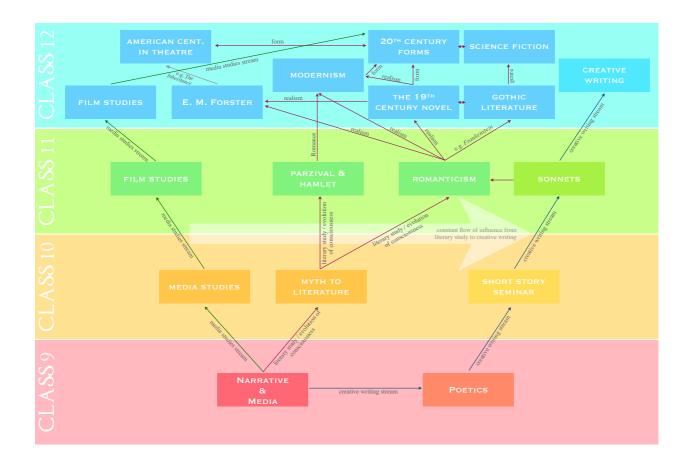
Projective Geometry: Roy Allen

Building on the work in Class XI, Projective Geometry in Class XII penetrates more deeply into the relationship between plane, line and point. The effect of infinitely distant elements is explored by constructing a sequence of measures of the line, forms using perspective and projective correspondences, symmetrical rotations and asymmetrical rotations (spirals). Polar transformations will also be constructed.

Complex Numbers: Roy Allen

The idea of number is extended through the introduction of the concept of an imaginary number, which will allow equations with no rational or irrational (real) solution to be solved. Complex numbers are defined as numbers having a real and an imaginary part and their properties are explored. The conjugate of a complex number is defined, the four arithmetic operations on complex numbers are carried out and the square roots of complex numbers are obtained. Quadratic and cubic (second and third order polynomial) equations are solved. Quadratic equations are formulated from their complex roots. The modulus and the argument of a complex number are defined and calculated. Complex numbers are represented graphically as Argand diagrams. De Moivre's Theorem and Euler's formula are investigated and applied. The powers and roots of complex numbers are explored.

ENGLISH



Class 9

Narrative Tradition: Peter Brewin

This is the students' first experience of studying literature in the High School, and endeavours to introduce and bring awareness of some of the narrative forms which exist in the world. Through the study of a novel, short stories, episodic television, and film the students learn about the four part story structure (situation, problem, solving, and outcome) and become aware of how different forms work, including the effects and mechanics of emotion (i.e. comedy and tragedy). Alongside study of existing texts the students write their own, thereby deepening their understanding, and are challenged to write (for many their first) formal essays.

Poetics: Peter Brewin

In this block the students take a close look at poetic forms and are formally introduced to ballads, haiku, and limericks. They learn how to observe and discern metre, rhythm, and rhyme through recitation and movement, and about literary imagery through imagination and observation. Most of the block consists of the students writing, rewriting, and editing their own poetry, and this culminates in a collection written by the class.

Class 10

Myth to Literature: Stella Ottewill

In the social sciences blocks Class 10 students are taken back to prehistoric and through ancient history, and with this block a similar thread is followed in literature. In seeking an answer to the question 'how did the world come to be this way?' they look at the origins of literature, beginning with creation myths. They look at the similarities and differences between creation myths from all over the world, and consider the strange, dream-like consciousness of these stories. We then turn to an extended study of an ancient text, typically Homer's Odyssey. Through this the students gain understanding of cause and effect logic, and learn to look at themes with greater sensitivity. The students are then challenged to write an essay, wherein they look at a theme or section of the text, and explore how language is used to create atmosphere and provoke feeling.

History of Drama: Stella Ottewill

Focusing on these three main themes, this block looks at the development of drama from Ancient Greece to Shakespeare, considering how characters struggle with their destinies and rebel against the forces that attempt to constrain them. Texts may include *Prometheus Bound* (Aeschylus), Antigone and Oedipus Rex (Sophocles), Medea (Euripides), Romeo & Juliet and *Macbeth* (Shakespeare).

Creative Writing: Stella Ottewill

Creative writing exercises are woven into many English blocks throughout the High School and sometimes students are offered the chance to deepen their creative writing skills in standalone blocks. For class 10 students the focus will be on strengthening their structural understanding of poetry and short stories, as well as nurturing their sensitive relationship with language.

Class 11

Parzival and Hamlet: Stella Ottewill

Study of Wolfram von Eschenbach's medieval epic Parzival is often considered the heart of class 11. This text can be considered in many ways: as a coming of age story, as an example of medieval literature, as a morality tale, as a philosophical meditation, as a comparative reflection on character, as a story of overcoming obstacles, as an exploration of the act of questioning. Parzival, as a picture of human development, sits directly between the characters of Odysseus and Hamlet, and through reflection upon the Class 10 From Myth to Literature block and the additional study of Hamlet, this block challenges the students to look at the inner life of the individual, as well as at narrative forms and use of language. The students are also challenged to engage with one or both of the texts through an essay or a creative response.

Romantics: Peter Brewin

Class 11 students look at Romanticism in different forms: art, music and literature. In literature this typically manifests as study of the lives and works of William Blake, William Wordsworth, Samuel Taylor Coleridge, Lord Byron, Percy Bysshe Shelley, Mary Shelley, and John Keats. Through close reading of their poetry and of Mary Shelley's Frankenstein the students consider form, imagery and narrative, with particular attention paid to the role of nature and the sublime, and humanity's place in the world. Through this they discuss the moral, spiritual and interpersonal relationships of these writers, and look at the works in their historical and biographical contexts. Out of these discussions the students produce a piece of written work which may be an analysis of one or several poems, or a biographical article about one or more of the writers studied.

Film Studies: Stella Ottewill

In order to facilitate deeper close-reading of texts suitable to class 11, students are given the opportunity to further their study of visual texts. The students watch, discuss and analyse a selection of films which are intellectually challenging, formally innovative, and which demonstrate the inner struggles of human beings. This analysis includes consideration of aesthetics, script, sound, and narrative, as well as deep exploration of themes, and how form and content meet one another. Texts used in previous years have included Eternal Sunshine of the Spotless Mind (dir. Gondry, 2004), Arrival (dir. Villeneuve, 2016), and Elizabeth (dir. Kapur, 1998).

Creative Writing: Stella Ottewill

Creative writing exercises are woven into many English blocks throughout the High School. In addition students are sometimes offered the chance to deepen their creative writing skills during standalone blocks. For class 11 students this has usually focused on the writing of sonnets, which offer both formal and intellectual challenge appropriate to this age. Other forms might include free verse poetry or short stories.

Class 12

Elective

Students who choose to specialise in English at Level 3 take three modules, which aim to develop their skills of close-reading, understanding of narrative, linking of themes, and exploration of underlying ideas. The primary content usually focuses on the 20th and 21st centuries, and has sometimes included dedicated blocks on Modern Literature, Film Studies, and Genre Fiction. Past texts have included: Jane Eyre (Brontë), The Waste Land (Eliot), Modern Times (dir. Chaplin, 1936), Fahrenheit 451 (Bradbury), The Graduate (dir. Nichols, 1967) and Fun Home (Bechdel). Texts change every year, but themes such as death, thresholds, love, family, haunting, and otherness, typically arise out of discussions. Students at this level are also given the opportunity to develop a creative writing portfolio, in which they have total freedom as to the forms, ideas and styles they wish to use.

SOCIAL SCIENCES

Class 9

In 2024/2025, Class 9 will have their Social Sciences blocks with Class 10.

Class 10

Research Project: Amanda Bell

In this block we begin with a current news item, or something from popular culture, chosen because it offers a range of different aspects that can be researched. After a general introduction, the students choose a thread to follow. They are supported in developing research skills as they produce a final report and presentation.

Pre-history and the Ancient World: Amanda Bell

We begin by watching Werner Herzog's 2010 film *Cave of Forgotten Dreams*². Then, through cave paintings and other artefacts from the last Ice Age, we observe and discuss what they suggest about the people who made them. In this way, we can develop the historical consciousness necessary for a study of the distant past.

We then look at the emergence of human civilisations in various parts of the world; the relationship to its location; why Mesopotamia is considered the 'Cradle of Civilisation' and then study and contrast the different ways in which human creativity manifests in Egypt and Greece in the sixth and fifth Centuries BC.

This work connects with the study of Creation myths, Gilgamesh and Homer's Odyssey in the English Main Lesson. We trace the changes in activity, interests and concerns through the ways human beings and the gods were represented, and try to draw some conclusions from close observation.

These blocks are complemented by sessions in clay modelling, drawing and painting from ancient artefacts, which enable closer observation and a growing familiarity with the quality and gesture of these objects.

Class 11

Research Project: Amanda Bell

In this block we begin with a current news item, or something from popular culture, chosen because it offers a range of different aspects that can be researched. After a general introduction, the students choose a thread to follow. They are supported in further development of their research, writing and presentation skills.

Medieval & Renaissance History: Amanda Bell

In Class 11, the idea of historiography is introduced through study of the transformation of the western territories of the Roman Empire into 'the first Europe'. As well as the development and increasing political dominance of the Catholic church in the west, we look at the influence of Roman, Greek, Germanic, Judaic, Persian and Arabic cultures on education and scholarship, both in the west and in the Abbasid Empire. Here we find the origins of the Renaissance and we trace its development in the 15th and 16th centuries.

² Herzog, W. (2010) Picturehouse Entertainment

The Enlightenment & Romanticism: Amanda Bell

This block traces the development of philosophical and scientific thought from the Renaissance to the middle of the 19th Century. We discuss the changing relationship between Church and state; questions about religion and science, about established societal structures and the emerging concept of the rights of 'Man'. We look at the Romantic movement through painting in England, France, Germany, America and Spain, in relation to the Enlightenment, Revolution, the Thirty Years' War, American independence, the Napoleonic Wars and European colonisation of the world.

Geography: Sarah Houghton

We study the distribution of ecosystems and people within our local and global environment. This links with their work in Class 9 and 10 on geomorphology, oceanography and climate. Detailed map skills are developed. An independent project on a chosen region is carried out in relation to this work.

Class 12

Modern and Contemporary History: Amanda Bell

In this block we focus on major events of the twentieth century and beginning of the twentyfirst. Study is auided by chapters from John Higgs's book Stranger Than We Can Imagine: Making Sense of the Twentieth Century³. Through individual projects, the students share their research into their chosen aspects of social and political history from the period. Out of this comes discussion about how these aspects are interconnected and how their consequences can be seen in the world today.

Modern and Contemporary Art and Design: Amanda Bell

"That art makes visible otherwise hidden cultural and psychological forces has long been recognised and has made it a tool for the cultural historian as well as the psychiatrist. It can be used to diagnose an age, a culture or a patient."⁴ We focus on artists - in the broadest sense - of the 20th and 21st Centuries. We discuss their work in the context of their biographies and contemporary social and political issues; we ask what motivates them; how their work reflects their time and conveys their ideas; evaluate the ideas themselves. After an overview of some of the main players in the major art movements of the first half of the 20th Century, students direct and lead the block through their own research, according to their individual interests.

Philosophy: Amanda Bell

In this Main Lesson we survey the thoughts and writings of various philosophers; how the way people thought about the meaning and nature of existence changed over time, and the effects of this thinking. Philosophies studied include those of Plato, Hobbes, Kant, Hegel, Mill, Hannah Arendt, Marx, Darwin and Freud. Capitalism and Socialism are major themes and we also look at Rudolf Steiner's Threefold Social Order to bring the students, in their last year at the school, something of what we are trying to do here.

Geography: TBA

Studies of changing communities over time are studied with respect to natural, cultural and economic systems.

³ Higgs, J. Stranger Than We Can Imagine: Making Sense of the Twentieth Century, 2015

⁴ Wassily Kandinsky, Concerning the Spiritual in Art, 1911

NATURAL SCIENCES

Class 9

Living Chemistry: Sarah Houghton

In this introduction to organic chemistry, students consider the role of carbon and its compounds. Rarefaction and solidification products starting from glucose are investigated. Production of alcohols, vinegar via fermentation and distillation processes are investigated experimentally and smelly esters are created. Experiments relating to solidification products consider the characteristics, production and use of starch, cellulose, wood, coal, wax and oil. Fossil fuels are considered first by experimentation, then extraction methods and uses are discussed. Natural and industrial organic compounds and their polymers are studied.

Physiology and Anatomy: Sarah Houghton

In this block students explore the sense organs, how they work together to create our perception of the world and relate to our central nervous system and brain. Students study the rhythmic system through a comparison of the human body with that of different animals.

Heat: Roy Allen

Through experiments temperature is defined and temperature measurement explored. By boiling water, melting ice and cooling molten wax latent and sensible heat are defined. The effect of pressure on freezing and boiling temperature is explored. The relationship between the temperature and pressure of a gas is investigated through the Pressure Law experiment from which absolute zero temperature will be discovered. The development of heat engines, from the early Steam engines to modern internal combustion engines – reciprocating, turbine, rocked - will be explored.

Physics: Daniel Figols

TBA

Geography: Sarah Houghton

During this main lesson students consider how the surface of the earth has changed over time and how the landforms we see around us have formed. Students explore sedimentation and erosion processes. In a global context, they investigate glaciation, volcanos, earthquakes and faulting to start contemplating the theory of plate tectonics. Maps of the global distribution of earthquakes and volcanoes are studied and this information gives them insight into the interior of the earth and how mountain chains, plate boundaries and midocean ridges are formed. Rock types and fossils are studied as visual guides to the landforms they may see in the field. OS map work helps them read and use maps to investigate the earth's surface.

Outdoor Curriculum: Sarah Houghton

According to the seasons and their age, students will be able to develop their knowledge of gardening and farming in the school grounds, and off site.

Class 10

Mechanics: Roy Allen

This Physics Main Lesson will focus on Mechanics. The section on statics will cover tensile and compressive forces, centre of area and centre of gravity, conditions for equilibrium, moments of forces, resolution of forces and the triangle and polygon of forces, elasticity, the stiffness of springs and Hooke's Law.

In dynamics velocity and acceleration will be defined from the results of experiments. Uniform acceleration as the result of gravity acting on a mass in free fall and the relationship between force, mass and acceleration will be investigated and discussed. Potential and kinetic energy will be explored and defined.

Inorganic Chemistry: Sarah Houghton

In this introduction to inorganic chemistry, students will study acids, bases, and salts and the reactivity series of metals. This is carried out through experiment, observation and analysis. We will examine different minerals from the earth and consider how they formed and what they are made of. Students will look and make salt crystals, investigate the role of water in crystallisation, and discover the qualities and reactivity of metals. From this students can start to derive the concepts of constant composition and definite proportion and start balancing reaction equations using words and symbols. This block builds on work done in Class 9 on organic chemistry and leads into Class 10 work on atomic theory and radioactivity.

Human Body Systems: Sarah Houghton

Students studied the senses, rhythmic system and brain and central nervous system in Class 9. Here students will attempt to complete the picture looking at other systems and considering the dynamic wholeness of the human organism. Students will study the structure and function of the digestive, respiratory, circulatory, sensory, reproductive, lymphatic and the endocrine system. Students will compare systems in the human with non-human as well as looking at diseases of these systems and how they affect the body as a whole. This work leads into the study of embryology in Class 11.

Ecology: Sarah Houghton

In this block, students study the living world around them, focusing on the plant and animal from the aspects of natural history and ecology. Different ecosystems are studied and compared. The dynamic between an ecosystem and human beings is explored at the level of habitat and subsistence.. Various skills and technologies will be explored through practical work on site and on field trips. This block builds on work done in Class 9 during outdoor curriculum and biology and organic chemistry and leads into a Class 11 work on botany.

Arboriculture: Sarah Houghton

This practical work involves students learning how to graft and care for their own apple tree. This is a starting point to the study of genetics. Students will learn about hedgerows by planting and laying them. This builds understanding of their importance as ecosystems and their ancestry linking into their work on ecology.

Class 11

Atomic Theory, Periodic Table & Radioactivity: Sarah Houghton

In this Class 11 Main Lesson block, the nature and history of the physical sciences is investigated following historically the path from the initial interest of alchemy during Greek times on to the Middle Ages and through time to our Modern age. This block crosses the chemistry/physics boundary; students start by studying the history and discoveries relating to atomic theory. Then the students delve into the depths of the Periodic Table investigating why certain chemicals are positioned where they are and what properties they have and how these elements and their compounds can be used in the world. Electron configuration patterns are looked at across the periodic table.

Physics: Daniel Figols

TBA

Botany: Sarah Houghton

In this block students observe plants via an evolutionary pathway of study and look at structure, functions and diversity. Students investigate photosynthesis, growth, reproduction, seed development and dispersal, and defence. We also focus on the ways human beings depend on plants, e.g. food, medicinal and cosmetic. Genetics are discussed.

Outdoor Curriculum: Sarah Houghton

In Class 11 linked to their botanical studies, students develop a herb and flower garden and the study of genetics is deepened.

Mechanics: Roy Allen

Building on the Class X Mechanics Main Lesson this course extends and deepens the study of forces in equilibrium and linear motion. Systems of forces are analysed algebraically and geometrically using vector diagrams in the form of the Polygon of Forces. The Law of the Lever, Hooke's Law, the equations of motion, the relationship between force, mass and acceleration, work, potential energy and kinetic energy are revised and expanded. Motion along an inclined plane, momentum and conservation of momentum are introduced.

Electricity and Magnetism: Roy Allen

This course will explore aspects of electricity and magnetism in order to develop an understanding of the underlying concepts and principles and their applications. The following areas will be investigated:

- Magnets, magnetic fields and magnetic induction
- Electrostatic charge
- Electric current, electromotive force and potential difference, and electrical resistance
- The relationship between current, voltage and resistance and Ohm's Law
- Resistors in series and parallel
- The relationship between magnetism and electric current
- Electric field strength, electron charge and forces in electric fields
- Electro magnets
- Magnetic field strength
- Electromagnetic induction
- Transformers
- DC and AC Generators
- Electric Motors

Embryology: Sarah Houghton

Building on the understanding of reproductive systems and hormones looked at in Class 10, this block focuses on the development of the human embryo. Organ formation, the phases of birth, childhood and the human life journey are discussed. Evolutionary aspects of human embryo development are compared with mammalian and non-mammalian embryo development revealing the paradox of an adult human form with embryonic features but with the unique status of self-consciousness and individuality. At the cellular level, cell structure, function and life processes are compared and discussed. Genetics will be discussed.

Class 12

Biology: Sarah Houghton

Class 12 biologists will begin by choosing a contemporary biological issue or area of interest to research and write a report on.

In human biology we will cover topics of respiration, digestion and immunity with some comparison in the plant and animal world. This will be brought into the realm of biotechnology and genetics where we will extract DNA from Kiwi fruit, build and run a gel electrophoresis chamber and test blood types as you would for transfusion.

There will be an opportunity to conduct an ecological experiment. Data will be collected via kick sampling, line transects or quadrating. There will be an opportunity to process this data through a chi squared stats test, isovels and charts. Species will be identified in the lab using microscopes and water pH will be tested using litmus paper. This will all be written up into an authentic scientific style report and used to help support the local authority's understanding of the area especially in the context of endangered bird nesting sites.

Chemistry: Sarah Houghton

Students will study chemistry of everyday life. Within this study students will consider the uses and the detail of the chemistry related to such topics studied. Topics will depend on the interests of the student but the underlying chemistry will be at level 3. Such topics may include, environmental chemical studies of ecocystems, pollution studies, electrochemistry and its use in industry wrt battery storage/electroplating and sacrificial anodes, polymers in relation to material science, biofuel production and specific heat energies of a variety of oils.

Evolutionary Biology: Sarah Houghton

Within this main lesson students investigate the evolutionary pathways of 'man and animal'. The lesson starts by carrying out a zoological comparative study of animals. Then students can move on to looking at the evolution of humans. The mighty resources of the museums and university research centres of London are used to explore and observe the teeth, skulls and skeletons and relics of our hominid ancestors and compare them with animals such as the shark and the primates. The viewpoints of science regarding evolution are compared with those of religion.

Physics: Daniel Figols

This block focuses on 20th and 21st Century Physics topics, which can include atomic physics, wave systems, electricity or mechanics. The block will be tailored to the interests and needs of the students who wish to take it. Students have in the past looked at gravitational waves, specific heat capacity of oils in relation to physics and mechanics. Students this year will consider optics/telescopes, solar cells in relation to collection of energy, engineering structures/mechanics and an astronomical topic.

PERFORMING ARTS

Class 9

Eurythmy: Michèle Hunter

In Class 9 we will be looking at working in block systems, which introduces the element of sustained team work in eurythmy. We will be working with all the elements involved in the creation process of a chosen piece and what this involves as a group, including collaboration, cooperation, leadership, following, remaining individuals whilst holding a group purpose as focus. The work in high school blocks usually lead to a performance.

Choir: Pan Liang Ho

Students work in weekly lessons throughout the year with a variety of different styles of music, singing in parts, working towards termly presentations/concerts related to festivals.

Band/Orchestra: Daniel Figols

Students work together with the other High School students with a variety of different styles of music, working towards a presentation at the end of the block. Students taking this course must also have private instrument lessons.

Class 10

Eurythmy: Michèle Hunter

In Class 10 we deepen the work started in Class 9 with more consciousness. The group chooses a tone piece (working out of music) or poem/literature, and approaching it with greater consciousness; expressing sounds, soul gestures, tones, intervals, and harmonies. They create their choreography out of greater understanding and freedom and put into practice the life skills from the previous year.

Choir: Pan Liang Ho

Students work with a variety of different styles of music, singing in parts, working towards termly presentations/concerts related to festivals.

Band/Orchestra: Daniel Figols

Students work together with the other High School students with a variety of different styles of music, working towards a presentation at the end of the block. Students taking this course must also have private instrument lessons.

Drama: Stella Ottewill

In the High School drama continues to be taught predominantly through the production of plays, and in classes 10 and 11 students have the opportunity to take part in a full production. In these productions students are supported in taking on performing roles, developing speech, characterisation, movement, blocking, and sometimes other stage craft. In addition to acting roles students also make up the production team, organising costumes, building sets, putting together props, designing posters and programmes

etc. Plays are chosen by the teacher, but always with the talents and interests of the specific classes in mind.

In addition, when there is a real interest in drama or where we feel it is appropriate, we offer some drama blocks wherein students work on scene studies aimed at developing specific skills, and familiarising themselves with a range of dramatic texts.

Class 11

Eurythmy: Michèle Hunter

Developing from last year, Class 11 choose the direction they wish in a more challenging way; this can be a two-voice tone piece where the students have to explore different musical aspects of one piece; or exploring different ways of expressing a poem. The elements can include the zodiac gestures, the planets, soul gestures, expressing colour and mood, musical phrasing and creating forms.

This year can also involve collaborative work with another subject where connections between things becomes more visible, more conscious; e.g; sculpture and eurythmy in which one subject informs and inspires the other, and vice versa. (Other subjects include literature, art, music, geometry, biology...).

Choir: Pan Liang Ho

Students work in twice-weekly lessons throughout the year with a variety of different styles of music, singing in parts, working towards termly presentations/concerts related to festivals.

Drama: Stella Ottewill

In the High School drama continues to be taught predominantly through the production of plays, and in classes 10 and 11 students have the opportunity to take part in a full production. In these productions students are supported in taking on performing roles, developing speech, characterisation, movement, blocking, and sometimes other stage craft. In addition to acting roles students also make up the production team, organising costumes, building sets, putting together props, designing posters and programmes etc. Plays are chosen by the teacher, but always with the talents and interests of the specific classes in mind.

In addition, when there is a real interest in drama or where we feel it is appropriate, we offer some drama blocks wherein students work on scene studies aimed at developing specific skills, and familiarising themselves with a range of dramatic texts.

Band/Orchestra: Daniel Figols

Students work together with the other High School students with a variety of different styles of music, working towards a presentation at the end of the block. Students taking this course must also have private instrument lessons.

Class 12

Eurythmy: Míchèle Hunter

In Class 12 the work is to create a chosen piece in more subtle ways than previously experienced; this involves the group creating a harmonious whole whilst each individual is working out of themselves, thus the two belong together whilst the individual expresses themself towards a common purpose. This can also include solo projects.

At this stage the students are usually involved in the whole performing process creating or choosing everything from the piece, the choreography, the expressions/mood to the lighting and costumes.

Class 12 Play: Stella Ottewill

The Class 12 Play is one of the core elements of the students' final year at school. Stepping up from the High School plays in Classes 10-11, the Class 12 students choose, cast, and produce a full-scale production. The teacher works collaboratively with the class to realise a united vision, and to support the students in their performance and production work. Usually Class 12 students all choose to take on performing roles, however this is not a requirement, and there is space for students to instead go more deeply into production roles, for example artistic direction, light and sound design, or even directing the play.

Drama: Stella Ottewill

Students specialising in Drama at Level 3 are required to take further modules. This can be a project wherein the students write, design, direct, and perform their own pieces, or work on monologues and direction projects in a variety of forms and genres. This curriculum is designed through conversations between the teacher and students.

Choir: Pan Liang Ho

Students work with a variety of different styles of music, singing in parts, working towards termly presentations/concerts related to festivals.

Band/Orchestra: Daniel Figols

Students work together with a variety of different styles of music, working towards a presentation at the end of the block.

THE CLASS 12 PROJECT

During their final year of school, students undertake a substantial independent project on a theme of their choosing. Each student is assigned a project supervisor with relevant knowledge and skill, who acts as a consultant and advisor, but the work is selfdirected and ranges from development of practical, movement or artistic skills to research projects and written dissertations

At the end of the year, the students make an exhibition of their projects and speak to the public about what they have been doing. This is followed by oral presentations, where they can explain more fully the process they have been through and answer questions.

CRAFTS & STUDIO ARTS

Kilian Voss, Julia Wallace, Amanda Bell, Peter Brewin

Students in all classes have a morning block in their class in which they are taught a programme designed to develop a range of basic skills which they can draw on in creating their own work. In the afternoons, students can choose from a range of workshops offered to all classes, in which they work in mixed-age groups. Students commit to their choice for a term or half a term at a time, and then they can change. Intensives are arranged in a similar way.

Crafts and Arts offered include:

Joinery, Wood carving, Copper work, Iron forging, Jewellery, Stone carving, Basketry, Leatherwork, Book binding, Printmaking, Pattern cutting & dressmaking, Clay modelling, Pottery, Drawing, Sculpture, Painting, Collage.

SPANISH

Yeny Barbosa

Rudolf Steiner maintained that within every language lies a distinct and characteristic way of looking at the world. Therefore, there is no single correct way to form and to express a thought. By learning a foreign language one can develop an understanding for other cultures which cultivates interest in people from different backgrounds. In 2024/2025, the school is offering Spanish.

A central place in the High School Modern language curriculum is taken up with verbal communication, aiming at strengthening oral skills and enabling the student to speak confidently in the foreign language. Students will also be immersed in the spirit of the foreign language through a variety of cultural expressions, ranging from Literature and Film to Music and Art.

Student exchange programmes are organised in consultation with those studying foreign languages. These usually take place in Class 9.

Languages are elective from Class 11.

PHYSICAL EDUCATION

Bothmer Movement: Susan Kelly

The Bothmer Exercises are designed to trace and enhance the inner development of a child into adulthood. They support the development of spatial awareness, coordination, inner poise and body control. In doing the exercises the students are required to reach out and become conscious of the space around them and at the same time develop an awareness of themselves. There is a series of exercises for each class that are worked on throughout the year, in addition to exercises that come earlier in the young person's development. For students taking an assessment in Bothmer Movement a demonstration is required at the end of a block of study.

High school students have a 40 minute lesson once a week. The lessons are made up of a variety of physical activities and the Bothmer Movement Exercises themselves.

The physical activities include but are not limited to: skipping, rhythm and timing challenges, balance challenges, speed challenges, coordination challenges and social games.

P.E: Susan Kelly

Students have a weekly class of 1 - 2 hours per week. Throughout the year students have a block of lessons either on or off site to give them a breadth of experience in different sports and activities.

On-site lessons include rounders, cricket, social games, cross country running, ultimate frisbee, badminton, volleyball, football and fitness sessions. Off-site activities take place largely at the local leisure centre and include tennis, squash and swimming.

INFORMATION AND COMMUNICATIONS **TECHNOLOGY**

Word Processing: High School staff

Word processing is introduced at the beginning of Class 9 and is taught as an integral part of every block where written work is required. Students will learn how to use word processing applications, including formatting, inserting images and footnotes/endnotes, to help them produce good quality written work.

Research Skills: High School staff

Research skills are taught in all subjects. Students learn how to use the internet for research; how to find useful and reliable sources, how to identify bias and how to reference in APA format.

STUDENT WELFARE

Each class has a Class Guardian whose role is the pastoral care of the students. Sometimes students ask for, or are assigned a personal tutor. Information about pastoral care, individual tutoring and mentoring is given in the Students' Handbook.

INCLUSION & ADDITIONAL NEEDS

The general educational provision in our school differs from a mainstream general educational provision in that our curriculum is based on the view of human development described by Rudolf Steiner. It is rich, diverse, and developmentally appropriate for each age; it integrates intellectual, practical, physical and artistic development, thus providing what any pupil needs to flourish as well as being indispensable for those with SEND.

The fact that we teach in whole-class mixed-ability peer groups and that many students in the school do not have English as a first language, observation and Adaptive Teaching are normal practice throughout the school. People learn in different ways and at different rates, and it is part of our work as teachers to present content in a variety of ways and set tasks that engage everyone in a range of different activities. As far as possible, further strategies are then devised for those who have needs that seem to be beyond the usual range.

We recognise that someone may have special needs permanently or develop them at any stage for physical, physiological, social or environmental reasons, and that learning difficulties can appear in one area of learning and not others, for example in numeracy but not literacy.

When additional or special needs are identified, the High School staff discuss what support is needed and our strategies are logged regularly by each teacher in the SEND register. In this way, it becomes clear what works best in each case.

LIFE AFTER SCHOOL

We invite people working in different professions to speak to the students and answer questions about their career path and life choices.

Upon entry to the High School (Class 9), students are consulted about their hopes and wishes for the future. This is taken into account in curriculum planning.

In Classes 9 and 10, the curriculum is broad and comprised mainly of compulsory subjects and courses, with courses in foreign languages, so that students don't limit their options for further study, life and employment.

In Class 10, students are consulted about options for Classes 11 & 12, with view to the paths they may wish to follow when they leave school. Individual and group guidance is given with regard to courses and blocks, personal projects, work experience, cultural exchanges, university and work applications, CVs and interviews.

ASSESSMENT & CERTIFICATION

Class 9

In Class 9, students' progress is monitored and assessed as it is in the Lower School.

The basis of the school's pupil assessment policy is progress and development, rather than norms and benchmarks; it is understood that a student's development does not follow a smooth upward path; that there are always pauses and spurts along the way; that each student will have a different journey. It is this individual journey that is assessed, to ensure that each student is developing appropriate faculties and skills and is achieving what is possible for them.

General Principles

- There is no formal assessment until Class 10
- There is continuous, informal, formative assessment and monitoring of students' progress
- Tracking of progress is monitored by the College via the mentoring system, the weekly High School meetings and by the trustee with responsibility for Teaching, Learning & Assessment.

Marking and Feedback

- Students' work is checked weekly. Drafts of work are marked and verbal feedback and advice is also given regularly.
- Each student's progress, participation in lessons, book work, presentations etc. are reviewed at the end of each block. These notes inform planning.
- In Art, Handwork, craft and performing arts lessons, work is monitored and discussed with students in every lesson. The work itself is a good indicator of effort, skill and progress.

Classes 10, 11 and 12

In Classes 10, 11 and 12, The St Michael High School offers assessment and certification through the Certificate of Steiner Education (NZCSE or CSE).

The NZCSE at Level 3 with University Entrance Levels in Maths and English has been deemed equivalent to A Level by NARIC UK. Since 2016, Class 12 students from The St Michael Steiner School have applied to universities in the UK through UCAS in the usual way, with their predicted grades in NZCSE Level 3, and have been offered places at the universities of their choice on that basis.

The following information comes from the Federation of Rudolf Steiner Waldorf Schools in New Zealand.

Overview of the Certificate of Steiner Education

This is a programme of secondary school qualifications, owned and qualitymanaged by the Federation of Rudolf Steiner Waldorf Schools in New Zealand Inc, who accredit schools to deliver the programme, and award the Certificate of Steiner Education at Levels 1, 2 and 3.

The Certificate of Steiner Educations were approved in December 2010 by the New Zealand Qualification Authority (NZQA) and are now registered as quality-assured aualifications on the New Zealand Qualifications Framework. This means that there is a public profile of the qualifications, which assures the users of the certificates that the qualifications meet the National Qualifications Framework levels (1, 2, and 3).

Internationally, the NZCSE Level 3 certificate is recognised for university entrance in all countries that have ratified the Lisbon Recognition Convention, i.e. all EU member states (except Greece and Monaco) plus UNESCO members including Australia, New Zealand and Israel. USA and Canada have also signed but have not yet ratified the treaty.

A detailed, rigorous and credible external moderation system to provide and ensure consistency and robustness to this qualification has been established and approved; it describes the requirements and processes of standardising, controlling, managing and assuring the quality of assessment against NQF levels, as well as assessment procedures, coherence and consistency between the schools.

The aualifications are necessarily based on what a teacher can see, read or hear sometimes touch or taste - that produces evidence of the student's understanding, knowledge or skills in nominated areas that represent the curriculum. The assessment is objective, represents external agreed levels of achievement, and is externally checked, both before and after a task leading to formal assessment is given.

Where the curriculum is based on developing personal auglities, or is more reflective or developmental in intent, a school may offer some other form of attestation to the teachers' assessment or impression of the student's achievement, if that is what is wished to be summarised and captured in a document. That document could take the form of a testimonial, personal profile, single school Record of Achievement, or

single school certificate. What must be clear is that the Certificate of Steiner Educations themselves are formal and official documents confirmed only by the Federation as meeting the national, quality assured requirements, which are based on the quality of the evidence provided by the student and collected by the teachers to support achievement at each level.

Certificate of Steiner Education Level 1

The Level 1 student is primarily, but not exclusively, a Class 10 student who has moved through 2 years (Classes 9 & 10) of the Steiner High School curriculum, and wishes to have certified his/her achievements in the whole of the year's learning programme, which is made up predominantly of Compulsory courses.

Graduates of the Certificate of Steiner Education Level 1 will have a firm foundation for the final two years of Steiner education (Classes 11 & 12). They will have engaged in a very broad range of activities and subject matter, have learnt to balance and reflect on what comes towards them, and have sensitivity to independent, alternative or creative views of the world.

Graduates at NZCSE Level 1 will have demonstrated the ability to work at directed activities, solve familiar problems in supervised contexts, and to transfer learning across a range of situations. They will typically have developed the ability to express their own beliefs, feelings and opinions clearly and with openness to the views of others.

The NZCSE Level 1 qualification is assessed across a mix of compulsory, broad and interdisciplinary courses, with some also being assessed through additional non-core areas.

6 compulsory core courses:

English Social Sciences General Sciences **Mathematics** Visual Arts/Crafts/Technology Drama/Music/Movement

1 non-core course:

Second Language

All courses are delivered and assessed at a level 1 standard. There are literacy and numeracy requirements integrated within the NZCSE Level 1.

Certificate of Steiner Education Level 2

This certificate is primarily, but not exclusively, for Class 11 students who have moved through 3 years (Classes 9 - 11) of the Steiner High School curriculum, Graduates of the Certificate of Steiner Education Level 2 will have a firm foundation for the final year of Steiner education (Class 12).

The NZCSE Level 2 qualification is assessed across a mix of compulsory broad and interdisciplinary courses, as well as additional, narrower subject areas:

6 compulsory core courses:

Enalish Social Sciences **General Sciences Mathematics** Visual Arts/Crafts Music/Movement

And additional subjects:

Foreign Languages **Mathematics Physics** Chemistry

Biology

Product Art: Art/Craft/Technology

Performance Art: Music/Movement/Drama

The compulsory core courses comprise at least one third of the year's programme. The additional courses may comprise up to two-thirds of the year's programme. All courses are delivered and assessed at a level 2 standard.

The Certificate of Steiner Education (NZCSE) Level 3

The Level 3 student is primarily, but not exclusively, a Class 12 student who has moved through 4 years (Years 9-12) of the Steiner High School curriculum, participating in a range of compulsory components, and who wishes to have certified his/her achievements in the whole of the final year's learning programme, which includes Compulsory courses.

The NZCSE Level 3 qualification is assessed across a mix of compulsory, broad and interdisciplinary courses, as well as and narrower subject areas:

4 compulsory core courses:

The Humanities The General Sciences The Arts Independent Research (Class 12 Project)

And elective subjects:

English

Second Language

Calculus

Statistics and Modellina

Physics

Chemistry

Biology

Social Sciences (Geography/History) Product Art: Art/Craft/Technology

Performance Art: Music/Movement/Drama

The school offers a set of assessments that reflect their capacities and previous subject programmes, and students choose to be assessed in these courses through interest, future directions, and capability, and are guided to do so through pathway support from teachers and qualified transition staff.

The compulsory core courses comprise one third of the year's programme. Students are required to pursue elements of the humanities, arts, sciences, mathematics, movement, drama, etc, through to the Class 12 graduation.

Graduate Statement

Graduates of the Certificate of Steiner Education Level 3 will have a comprehensive foundation for leaving school as independent life-long learners who are able to be self-reflective and take initiative when required. It is our aim that they have openness and connectedness to the world and its peoples, demonstrate tolerance and respect for others, and have a curiosity about all aspects of life.

As part of their studies, Certificate of Steiner Education graduates have undertaken a year-long independent study which will have demonstrated the ability to plan,

organise, research, produce, write and present their findings to meet a high level of public and educational expectation. Graduates will have demonstrated the ability to problem-solve and apply learning across a broad range of contexts. They take action to follow things through to their conclusion.

Graduates will have persisted in a very broad range of activities and subject matter, have sensitivity to independent, alternative or creative views of the world, and have developed a strong sense of personal responsibility and ambition.

Students whose certificates have been awarded at Highly Commended or Distinction will be well-prepared to continue higher level study in the relevant subject areas.

How the Certificates are Attained

The qualification is awarded based on the collection of evidence required to support the decision of the teacher against detailed assessment criteria specified for each Learning Outcome. Each Learning Outcome has been approved as at the "correct" (NQF) level, has an individual weighting against the whole qualification, and is described in terms of Assessment Criteria.

Assessment decisions are made against requirements within 4 bands: Achieved, Merit, Excellence and Not Achieved.

It is important to note that Learning Outcomes are just the (preferably small) assessable part of any teaching and learning. They are not the course; they are not the content; they should not drive what is taught; ideally courses or blocks of learning should be descriptive of what is taught/learnt, not what is assessed. From what is taught, an appropriate Learning Outcome (or more) is selected because that will be the best context in which to find the evidence.

Assessment can generally occur any time during a course, is integrated with learning, and, where practicable, with other assessment events.

Assessment events include activities or tasks such as a project, assignment, essay, report, test, examination, product (e.g. art, writing portfolio) or performance (e.g. laboratory experiment, tool or materials handling, drama, speech, music and movement demonstrations).

A student will have achieved the NZCSE Level 3 upon attainment of a total of 50 NZCSE points (18 points in compulsory subject areas and 32 NZCSE points in areas of the Class 12 programme). Achievement is confirmed by the Federation's Qualifications Committee after the end of the school year and certificates are awarded early the following year and posted to the students. The certificates may be awarded with two levels of endorsement:

- For level 3, a certificate will be endorsed with the words "Highly Commended" when the student has gained 35 NZCSE points or more at Merit or Excellence (maximum of 10 points of these from compulsory Learning Outcomes).
- For level 3, a certificate will be endorsed with the words "with Distinction" when the student has gained 35 NZCSE points or more at Excellence (maximum of 10 points of these from compulsory Learning Outcomes).
- For evidence of literacy to University Entrance standard, at least 5 NZCSE points must come from specified literacy Learning Outcomes and achievement criteria.

• For evidence of numeracy to University Entrance standard, at least 5 NZCSE points must come from specified Learning Outcomes in either the NZCSE Level 2, or NZCSE Level 1

A student will qualify for the award of the Certificate of Steiner Education Level 2 upon attainment of a total of 50 NZCSE points (30 points in compulsory subject areas of the Class 11 programme plus a further 20 NZCSE points in additional areas of the Class 11 programme).

Certificate of Steiner Educations at Level 2 may be awarded with two levels of endorsement:

- For Level 2, a certificate will be endorsed with the words "Highly Commended" when the student has gained 30 NZCSE points or more, at the level or higher, at Merit or Excellence.
- For Level 2, a certificate will be endorsed with the words "with Distinction" when the student has gained 30 NZCSE points or more, at the level or higher, at Excellence.

A student will qualify for the award of the Certificate of Steiner Education Level 1 upon attainment of a total of 50 NZCSE points at level 1 or higher, including 30 in compulsory subject areas of the Class 10 programme. The certificate can be awarded with two levels of endorsement:

- For Level 1, a certificate will be endorsed with the words "Highly Commended" when the student has gained 30 NZCSE points or more, at the level or higher, at Merit or Excellence.
- For Level 1, a certificate will be endorsed with the words "with Distinction" when the student has gained 30 NZCSE points or more, at the level or higher, at Excellence.
- For evidence of minimum literacy and numeracy requirements for completion of the Level 1 qualification, at least 10 points must come from the specified Literacy and Numeracy foundation requirements nominated in the Learning Outcomes and achievement criteria.



Park Road, Hanworth Park, London TW13 6PN

Tel: 0208 893 1299 Finance: 07436 562820 Email: info@stmichaelsteiner.hounslow.sch.uk Website: www.stmichaelsteiner.hounslow.sch.uk The St Michael Steiner School is a registered charity no 1094960 and a company limited by guarantee no 04364394