

**Meridian International School s.r.o.**



**Meridian International School Curriculum**

**Grade 9 / Year 10**

# Framework for the Meridian International School Curriculum

## Grade 9/Year 10 (Key Stage 4)

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## Disclaimer

To ensure the very best standards of learning and a quality education for our students, Meridian International School, Prague, aims to offer an up-to-date, comprehensive, unique, as well as a thoroughly modern curriculum. Combining the high level of British academic standards with a forward-thinking, international outlook, our curriculum intends to be innovative and challenging, whilst also being accessible in addition to making a challenging learning environment enjoyable for any student that is already enrolled or is thinking of joining our school.

In keeping with these high academic standards, the Meridian International School curriculum for Grade 9 has been developed from the following national government and private educational authorities:

- ❖ Her Majesty's Government Department for Education
  - <https://www.gov.uk/government/organisations/department-for-education>
  
- ❖ National Curriculum in England (Secondary Education)
  - <https://www.gov.uk/government/publications/national-curriculum-in-england-secondary-curriculum>
  
- ❖ Cambridge International Examinations (Secondary)
  - <http://www.cie.org.uk/programmes-and-qualifications/cambridge-secondary-2/>
  
- ❖ Czech Republic Ministry of Education, Youth and Sports – Framework Educational Programme for Basic Education
  - <http://www.msmt.cz/areas-of-work/basic-education-1>

## Subjects of Study

During Grade 9, students at Meridian International School focus on the following subjects of study.

* English	(4 hours)
* Mathematics	(5 hours)
* Biology	(4 hours)
* Chemistry	(4 hours)
* Physics	(4 hours)
* Geography	(2 hours)
* Global Perspectives	(2 hours)
* History	(2 hours)
* Information Technology	(2 hours)
* Business Studies	(2 hours)
* Modern Languages	(3 hours)
* Physical Education	(2 hours)
* <i>Economics</i>	<i>(2 hours)</i>

Each subject is taught in full compliance with the National Curriculum of England.

\* *Economics classes are held outside of regular classroom hours*

## **English (Course Description)**

By the beginning of Grade 9, pupils should be able to read and confidently analyze a wider range of contemporary and classic fiction and nonfiction texts with developing accuracy. During Grade 9, teachers should continue to emphasise pupils' enjoyment and understanding of language, especially vocabulary, to support their reading and writing.

They should be able to read and understand most words effortlessly and determine unfamiliar vocabulary using linguistic and contextual clues. Pupils' knowledge of language, gained from stories, plays, poetry, non-fiction and textbooks, will support their increasing fluency as readers, their facility as writers, and their comprehension. Teachers should show pupils how to understand the relationships between words, how to understand nuances in meaning, and how to further develop their understanding of, and ability to use, figurative language. It is important that pupils learn the correct grammatical terms in English and that these terms are integrated within teaching.

They should be reading frequently, outside as well as in school, for pleasure and information. Pupils should be able to summarise and analyze multiple readings of extended lengths accurately and in their own words. They should be able to read independently, with clear understanding, inferring the unstated nuances within the texts based on personal observations, and then discuss their findings in a coherent written and verbal manner.

In Grade 9, pupils should be reading a wide range of high-quality, challenging, classic literature and extended literary non-fiction, such as essays, reviews and journalism. Pupils should understand how language, including figurative language, vocabulary choice, grammar, text structure and organisational features present meaning within and across these texts.

Pupils should be taught to write accurately, fluently, effectively and at length for pleasure and information through by adapting their writing for a wide range of purposes and audiences: to describe, narrate, explain, instruct, give and respond to information, and argue. They should be able to plan, write, and revise their own writing for extended academic writings. These synthesized writings should include independent academic research and reflection. They should be able to use and analyze academic primary sources for neutrality and validity. They should continue making critical comparisons, referring to the contexts, themes, characterisation, style and literary quality of texts, and drawing on knowledge and skills from wider readings.

Teachers should build on the knowledge and skills that pupils have been taught at key stage 3. Decisions about progression should be based on the security of pupils' linguistic knowledge, skills and understanding and their readiness to progress to the next stage. Pupils whose linguistic development is more advanced should be challenged through being offered opportunities for increased breadth and depth in reading and writing. Those who are less fluent should consolidate their knowledge, understanding and skills, including through additional practice. By the end of Grade 9, pupils' confidence, and mastery of language should be demonstrated through formal assessments of public speaking, collaborative discussion, and debate in addition to reading and writing. Pupils should use linguistic and literary terminology accurately and confidently in discussing reading, writing and spoken language. They should be able to communicate effectively and expressively by choosing and adjusting tone and style of speech to audience and purpose in addition to appropriate vocabulary and grammar. Pupils should understand nuances in vocabulary choice and age-appropriate, academic vocabulary. This involves consolidation, practice and discussion of language.

Teachers should prepare pupils for key stage 4 by ensuring that they can consciously and coherently express themselves in their writing and speech. Pupils should be able to confidently read and make critical comparisons across texts and create and develop personal opinions with detailed supporting evidence rooted in academic research.

## English (Course Objectives)

### i) Reading – Word Reading:

- Apply their growing knowledge of root words, prefixes and suffixes (morphology and etymology), both to read and to understand the meaning of new words that they meet.

### ii) Reading – Comprehension:

- Maintain positive attitudes to reading and understanding of what they read by:
  - Continuing to read and discuss an increasingly wide range of contemporary and classic fiction, poetry, plays, non-fiction and reference books or textbooks from all over the world
  - Reading texts that are structured in different ways and reading for a range of purposes
  - Increasing their familiarity with a wide range of books, including short stories, extended modern fiction, fiction from our literary heritage, and books from other cultures and traditions
  - Recommending books that they have read to their peers, giving reasons for their choices
  - Identifying and discussing themes and conventions in and across a wide range of writing
  - Make detailed comparisons within and across multiple texts
  - Learn and recite a wider, more complex range of poetry keeping in mind intonation, inflection, and dialect
  - Preparing poems and plays to read aloud and to perform, showing understanding through intonation, tone and volume so that the meaning is clear to an audience
- Understand what they read by:
  - Checking that the book makes sense to them, discussing their understanding and exploring the meaning of words in context
  - Asking questions to improve their understanding

- Drawing inferences such as inferring characters' feelings, thoughts and motives from their actions, and justifying inferences with textual evidence
  - Predicting what might happen from details stated and implied
  - Summarizing the main ideas drawn from more than one text, identifying key details that support the main ideas
  - Identifying how language, structure and presentation contribute to meaning
- Discuss and evaluate how authors use language, including figurative language, considering the impact on the reader
  - Distinguish between statements of fact and opinion in reading and in speech
  - Retrieve, record and present information from non-fiction
  - Participate in discussions about texts read independently and as a group, building on their own and others' ideas and challenging views courteously
  - Explain and discuss their understanding of what they have read, including through formal presentations and debates, maintaining a focus on the topic and using notes where necessary
  - Provide reasoned justifications for their views.

**iii) Writing – Composition:**

- Write legibly, fluently and with increasing speed and dexterity
- Plan their writing by:
  - Identifying the audience for and purpose of the writing, selecting the appropriate form and using other similar writing as models for their own
  - Noting and developing initial ideas using purposeful organization tools and drawing on reading and research where necessary

- In writing narratives, considering and emulating how authors have developed characters and settings in other texts
- Draft and write by:
- Selecting appropriate grammar and vocabulary, understanding how such choices can change and enhance meaning
  - In narratives, describing settings, characters and atmosphere and integrating dialogue to convey character and advance the action.
  - Continuing to use figurative, poetic, and rhetorical language techniques in both persuasive and expository writings
  - Using a wide range of transitional and structural devices such as spacing, headings, and transition words and phrases to build cohesion and fluidity within and across paragraphs
  - Using further organizational and presentational devices to structure text and to guide the reader through a text
- Evaluate and edit by:
- Assessing the effectiveness of their own and others' writing in a formal and constructive manner
  - Proposing and accepting changes to vocabulary, grammar and punctuation to enhance effects and clarify meaning
  - Ensuring the consistent and correct use of tense throughout a piece of writing
  - Ensuring correct subject and verb agreement when using singular and plural, distinguishing between the language of speech and writing and choosing the appropriate register
- Proof-read for spelling and punctuation errors.
- Orally perform their own compositions, using appropriate intonation, volume, and movement so that meaning is clear.

**iv) Writing – Vocabulary, Grammar and Punctuation:**

- Develop their understanding and continue successful usage of the concepts set out in Key Stage 2. In particular, pupils should master the following grammatical objectives by the end of grade 9:
  - Recognizing vocabulary and structures that are appropriate for formal speech and writing
  - Identifying and analyzing the elements of a sentence (parts of speech, subject, object, complement etc.)
  - Continuing to diagram sentences of increasing difficulty
  - Expand knowledge of morphology, particularly with regard to prefixes, affixes, and suffixes which stem from Greek and Latin
  - Recognizing types and purposes of phrases and clauses within a sentence
  - Recognizing the varying degrees of register within and across texts and purposefully implementing these variations in writing
  - Identify and analyze the etymological origin of modern English vocabulary
  - Understand how cultures, languages, and dialect can affect both meaning and pronunciation of modern English
  
- Use and understand the grammatical and literary terminology accurately and appropriately in discussing their writing and reading.

## **Mathematics (Course Description)**

The aims of the curriculum are the same for all candidates. The aims are set out below and describe the educational purposes of a course in mathematics for the Cambridge IGCSE examination. The aims are to enable candidates to: develop their mathematical knowledge and oral, written and practical skills in a way which encourages confidence and provides satisfaction and enjoyment; read mathematics, and write and talk about the subject in a variety of ways; develop a feel for number, carry out calculations and understand the significance of the results obtained; apply mathematics in everyday situations and develop an understanding of the part which mathematics plays in the world around them; solve problems, present the solutions clearly, check and interpret the results; develop an understanding of mathematical principles; recognise when and how a situation may be represented mathematically, identify and interpret relevant factors and, where necessary, select an appropriate mathematical method to solve the problem; use mathematics as a means of communication with emphasis on the use of clear expression; develop an ability to apply mathematics in other subjects, particularly science and technology; develop the abilities to reason logically, to classify, to generalise and to prove; appreciate patterns and relationships in mathematics; produce and appreciate imaginative and creative work arising from mathematical ideas; develop their mathematical abilities by considering problems and conducting individual and co-operative enquiry and experiment, including extended pieces of work of a practical and investigative kind; appreciate the interdependence of different branches of mathematics; and acquire a foundation appropriate to their further study of mathematics and of other disciplines.

## Mathematics (Course Objectives)

### Course Objectives

#### i) Number

Demonstrate an understanding of factors and multiples.

- Identify and classify types of numbers.
- Find common factors and common multiples of numbers.
- Write numbers as products of numbers.
- Write numbers as products of their prime factors.

Determine the square root of positive rational numbers that are perfect squares.

- Calculate squares, square roots, cubes, and cube roots of numbers.
- Work with integers used in real – life situations.

Explain and apply the order of operations, including exponents, with and without technology.

Determine the square root of positive rational numbers that are perfect squares and determine an approximate square root of positive rational numbers that are non-perfect squares.

- Calculate squares, square roots, cubes, and cube roots of numbers.
- Work with integers used in real – life situations.
- Revise the basic rules for operating with numbers.
- Perform basic calculations using mental methods and with a calculator.

Demonstrate an understanding of rational numbers by comparing and ordering rational numbers and solving problems that involve arithmetic operations on rational numbers.

- Find equivalent fractions.
- Simplify fractions.
- Add, subtract, multiply and divide fractions and mixed numbers.
- Find fractions of numbers.
- Find one number as a percentage of another.
- Find a percentage of a number.
- Calculate percentage increases and decreases.
- Increase and decrease by a given percentage.
- Handle reverse percentages (undoing increases and decreases).
- Work with standard form.
- Make estimations without a calculator.

Develop an understanding of number sequences.

- Describe the rule for continuing a sequence.
- Find the  $n$ th term of some sequences.
- Use the  $n$ th term to find terms from later in a sequence.
- Generate and describe sequences from patterns of shapes.

Explain sets and set properties.

- Generate and describe sequences from patterns of shapes.
- List the elements of a set that have been described by a rule.
- Find unions and intersections of sets.

- Find complements of sets.

Identify Venn diagrams.

- Represent sets in Venn diagrams.
- Solve problems using Venn diagrams.

## **ii) Algebra**

Demonstrate an understanding of algebraic expressions.

- Use letters to present numbers.
- Write expressions to present mathematical information.
- Substitute letters with numbers to find the value of an expression.
- Add and subtract like terms to simplify expressions.
- Multiply and divide to simplify expressions.
- Expand expressions by removing grouping symbols.
- Use index notation in algebra.
- Learn and apply the laws of indices to simplify expressions.
- Work with fractional indices.

Determine expanding brackets that have been multiplied by a negative number and factorise an algebraic expression.

- Expand brackets that have been multiplied by a negative number.
- Solve a linear equation.
- Factorize an algebraic expression where all terms have common factors.

Rearrange a formula.

- Rearrange a formula to change the subject.

Draw line graphs by using tables.

- Construct a table of values and plot points to draw graphs.

Find gradient, length and equation of a line graph.

- Find the gradient of a straight line graph.
- Recognize and determine the equation of a line.

Develop an understanding of quadratic expressions.

- Determine the equation of a line parallel to a given line.
- Calculate the gradient of a line using co-ordinates of points on the line.
- Find the length of a line segment and the co-ordinates of its midpoint.
- Expand products of algebraic expressions.
- Factorize quadratic expressions.
- Solve quadratic equations by factorization.

### **iii) Measurement and Geometry**

Measure lines and angles.

- Use the correct terms to talk about points, lines, angles and shapes.
- Classify, measure and construct angles.
- Calculate unknown angles using angle relationships.

Construct a triangle given the three sides using ruler and pair of compasses only.

- Talk about the properties of triangles, quadrilaterals, circles and polygons.

Construct other simple geometrical figures from given data using ruler and protractor as necessary.

- Use a ruler and a pair of compasses to bisect lines and angles.
- Use instruments to construct triangles and other geometrical figures.
- Calculate unknown angles in irregular polygons.

Construct angle bisectors and perpendicular bisectors using straight edge and pair of compasses only.

Carry out calculations involving the perimeter and area of a rectangle, triangle, parallelogram and trapezium and compound shapes derived from these.

- Calculate areas and perimeters of two-dimensional shapes.
- Calculate areas and perimeters of shapes that can be separated into two or more simpler polygons.

Carry out calculations involving the circumference and area of a circle.

- Calculate areas and circumferences of circles.

Carry out calculations involving the volume of a cuboid, prism and cylinder and the surface area of a cuboid and a cylinder.

Carry out calculations involving the areas and volumes of compound shapes.

- Calculate perimeters and areas of circular sectors.
- Understand nets for three-dimensional solids.
- Calculate volumes and surface areas of solids
- Calculate volumes and surface areas of pyramids, cones and spheres.

Apply Pythagoras' theorem.

- Use Pythagoras' theorem to find unknown sides of a right angled triangles.
- Learn how to use Pythagoras' theorem to solve problems.

Use the relationships between areas of similar triangles, with corresponding results for similar figures and extension to volumes and surface areas of similar solids.

- Decide whether or not triangles are mathematically similar.
- Use properties of similar triangles to solve problems.
- Find unknown lengths in similar figures.
- Use the relationship between sides and areas of similar figures to find missing values.
- Recognize similar solids.
- Calculate the volume and surface area of similar solids.
- Decide whether or not triangles are congruent.

#### **iv) Data**

Collect, classify and tabulate statistical data. Read, interpret and draw simple inferences from tables and statistical diagrams.

- Collect data and classify different types of data.
- Organize data using tally tables, frequency tables and two-way tables.
- Draw pictograms, bar graphs, and pie charts to display data and answer questions about it.

Calculate the probability of a single event as either a fraction, decimal or percentage.

- Calculate possibilities associated with simple experiments.

Calculate the probability of simple combined events, using possibility diagrams and tree diagrams where appropriate.

- Use probability diagrams to help you calculate probability of combined events.
- Identify when events are independent.
- Identify when events are mutually exclusive.

Calculate the mean, median, mode and range for individual and discrete data and distinguish between the purposes for which they are used.

- Calculate the mean, median and mode of sets of data.
- Calculate and interpret the range as a measure of spread.
- Interpret the meaning of each result and compare data using these measures.
- Construct and use frequency distribution tables for grouped data.

Calculate an estimate of the mean for grouped and continuous data. Identify the modal class from a grouped frequency distribution.

- Construct and use frequency distribution tables for grouped data.
- Identify the class that contains the median of grouped data.
- Identify the class with quartiles.
- Divide data into quartiles and calculate the interquartile range.
- Identify the modal class from a grouped frequency distribution.

## **Biology (Course Description)**

The main aim of Biology teaching in Grades 9 and 10 is to prepare students for IGCSE tests in Biology. Biology is the science of living organisms (including animals, plants, fungi and microorganisms) and their interactions with each other and the environment. The study of biology involves collecting and interpreting information about the natural world to identify patterns and relate possible cause and effect. Biological information is used to help humans improve their own lives and strive to create a sustainable world for future generations. Students should be helped to understand how, through the ideas of biology, the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas which are of universal application.

Students should acquire sufficient knowledge and understanding to basic biological themes, they should become confident citizens in a technological world and develop an informed interest in scientific matters. Students should recognize that science is evidence based and understand the usefulness, and the limitations, of scientific method. Students should also develop skills that are relevant to the study and practice of biology and that are useful in everyday life. Students will be encouraged to solve biological problems on their own and to communicate effectively about it through the language of science. Students should also to develop attitudes relevant to biology such as concern for accuracy and precision, objectivity, integrity, enquiry, initiative and inventiveness. Students will be encouraged to appreciate that science is subject to social, economic, technological, ethical and cultural influences and limitations and that the applications of science may be both beneficial and detrimental to the individual, the community and the environment.

## **Biology (Course Objectives)**

### **i) Characteristics and classification of living organisms**

- List and describe the characteristics of living organisms
- Define the terms nutrition, excretion, respiration, sensitivity, reproduction, growth and movement
- Define and describe the binomial system of naming species
- List the main features of the following vertebrates: bony fish, amphibians, reptiles, birds and mammals
- List the main features used in the classification of the following groups: flowering plants (monocotyledons and eudicotyledons (dicotyledons), arthropods (insects, crustaceans, arachnids and myriapods), annelids, nematodes and mollusks
- Use simple dichotomous keys based on easily identifiable features

### **ii) Cell Structure and Organisation**

- Identify and describe the organelles of a plant and animal cells
- Relate the organelles to their functions
- Describe the differences in structure between typical animal and plant cells
- Define the terms tissue, organs and organ systems
- Define diffusion, osmosis and active transport and describe their importance for living organisms.
- Calculate magnification and size of biological specimens

### **(iii) Nutrition**

- List the principal components of a healthy diet, their importance, food sources and symptoms of deficiency.
- Define the terms digestion, ingestion, egestion, absorption and assimilation.
- Define mechanical and chemical digestion and examples of both.
- Define the terms catalysts and enzymes and describe the effect of temperature and pH on enzyme activity
- Identify the main regions of the alimentary canal and associated organs and describe the functions.
- Define photosynthesis, including word equation, and describe factors affecting the rate of photosynthesis.
- Identify the main parts of leaf, including cuticle, stomata, vascular bounds, cellular and tissue structure.
- Describe the importance of nitrate and magnesium ions for plants growth.

### **(iv) Transportation**

- Identify the positions of xylem and phloem tissues in transverse sections of stems and leaves and state their functions
- Identify root hair cells and state their function
- State the pathway taken by water through root, stem and leaf
- Define transpiration and factors affecting its rate
- Explain the difference between single and double circulatory organ system.
- Describe the structure and function of heart, including muscular wall and septum, chambers, valves and associated blood vessels.

- Explain the difference between arteries, veins and capillaries and name the most important vessels in the body.
- List the components of blood and their functions.

**v) Respiration**

- Define respiration and state the uses of energy in the body of humans
- Explain the difference between aerobic and anaerobic respiration and give word equation of both reactions.
- Identify the main organs of human respiratory system and describe their functions.
- Describe the effects of physical activity on rate and depth of breathing

**vi) Excretion in Humans**

- Define excretion and give the substances that have to be excreted from the body.
- Identify the main organs of human urinary system and describe their functions.

**vii) Coordination and Response**

- Describe the main parts of human nervous systems and state their functions.
- Describe a simple reflex arch in terms of sensory, motor and relay neuron, stimulus, receptor, sense organ and effector.
- Describe the structure and function of the eye, including accommodation and pupil reflex.
- Define hormone and state their function in body coordination, including the names and functions of some specific hormones.
- Compare hormonal and nervous control systems.

- Define the terms geotropism and phototropism.

**viii) Homeostasis**

- Define the term homeostasis and describe the maintenance of a constant body temperature and constant glucose level in humans

## **Chemistry (Course Description)**

The main aim of Chemistry teaching in Grades 9 and 10 is to prepare students for IGCSE tests in Chemistry. Chemistry is the science of the composition, structure, properties and reactions of matter, understood in terms of atoms, atomic particles and the way they are arranged and link together. It is concerned with the synthesis, formulation, analysis and characteristic properties of substances and materials of all kinds. Students should be helped to appreciate the achievements of chemistry in showing how the complex and diverse phenomena of both the natural and man-made worlds can be described in terms of a small number of key ideas which are of universal application.

Students should acquire sufficient knowledge and understanding to basic chemical themes, they should become confident citizens in a technological world and develop an informed interest in scientific matters. Students should recognize that science including chemistry is evidence based and understand the usefulness, and the limitations, of scientific method. Students should also develop skills that are relevant to the study and practice of chemistry and that are useful in everyday life. Students will be encouraged to solve chemical problems on their own and to communicate effectively about it through the language of science. Students should also to develop attitudes relevant to chemistry such as concern for accuracy and precision, objectivity, integrity, enquiry, initiative and inventiveness. Students will be encouraged to appreciate that science is subject to social, economic, technological, ethical and cultural influences and limitations and that the applications of science may be both beneficial and detrimental to the individual, the community and the environment.

## **Chemistry (Course Objectives)**

### **i) The Particulate Nature of Matter**

- State the distinguishing properties of solids, liquids and gases
- Describe the structure of solids, liquids and gases in terms of particle separation, arrangement and types of motion
- Describe changes of state in terms of melting, boiling, evaporation, freezing, condensation and sublimation
- Describe the pressure and temperature of a gas in terms of the motion of its particles
- Describe and explain diffusion

### **ii) Experimental Techniques**

- Name appropriate apparatus for the measurement of time, temperature, mass and volume
- Demonstrate knowledge and understanding of paper chromatography and interpret simple chromatograms
- Identify substances and assess their purity from melting point and boiling point information
- Describe and explain methods of purification by the use of a suitable solvent, filtration, crystallization and distillation
- Suggest suitable purification techniques, given information about the substances involved

### **iii) Atoms, Elements, and Compounds**

- State the relative charges and approximate relative masses of protons, neutrons and electrons
- Define atomic number and atomic mass

- Use proton number and the simple structure of atoms to explain the basis of the Periodic Table
- Define isotopes, state the two types of isotopes as being radioactive and non-radioactive and state one medical and one industrial use of radioactive isotopes
- Describe the build-up of electrons in ‘shells’ and understand the significance of the noble gas electronic structures and of the outer shell electrons
- Describe the differences between elements, mixtures and compounds, and between metals and non-metals
- Describe the formation of ions by electron loss or gain
- Describe the formation of ionic bonds between elements from Groups I and VII
- Describe the formation of single covalent bonds
- Describe the differences in volatility, solubility and electrical conductivity between ionic and covalent compounds
- Describe the giant covalent structures of graphite and diamond and relate their structures to their uses

#### **iv) Stoichiometry**

- Use the symbols of the elements and write the formulae of simple compounds
- Deduce the formula of a simple compound from the relative numbers of atoms present
- Deduce the formula of a simple compound from a model or a diagrammatic representation
- Construct word equations and simple balanced chemical equations
- Define relative atomic mass and relative molecular mass

## v) Electricity and Chemistry

- Define electrolysis and describe the electrode products and the observations made during the electrolysis of selected chemicals.
- State the general principle that metals or hydrogen are formed at the negative electrode (cathode), and that non-metals (other than hydrogen) are formed at the positive electrode (anode)
- Predict the products of the electrolysis of a specified binary compound in the molten state
- Describe the electroplating of metals and outline its uses.
- Describe the reasons for the use of copper and aluminum in cables, and why plastics and ceramics are used as insulators

## vi) Chemistry and Energetics

- Describe the meaning of exothermic and endothermic reactions and give examples of both
- Interpret energy level diagrams showing exothermic and endothermic reactions
- Describe the release of heat energy by burning fuels
- State the use of hydrogen as a fuel
- Describe radioactive isotopes, such as a source of energy

## vii) Chemical Reactions

- Identify physical and chemical changes, and understand the differences between them
- Describe and explain the effect of concentration, particle size, catalysts (including enzymes) and temperature on the rate of reactions

- Interpret data obtained from experiments concerned with rate of reaction
- Understand that some chemical reactions can be reversed by changing the reaction conditions
- Define oxidation and reduction in terms of oxygen loss/gain.

### **viii) Acids, Bases and Salts**

- Describe the characteristic properties of acids as reactions with metals, bases, carbonates and effect on litmus and methyl orange
- Describe the characteristic properties of bases as reactions with acids and with ammonium salts and effect on litmus and methyl orange
- Describe neutrality and relative acidity and alkalinity in terms of pH measured using Universal Indicator paper
- Describe and explain the importance of controlling acidity in soil
- Classify oxides as either acidic or basic, related to metallic and non-metallic character
- Suggest a method of making a given salt from a suitable starting material, given appropriate information

## **Physics (Course Description)**

The main aim of Physics teaching in Grades 9 and 10 is to prepare students for IGCSE tests in Physics. Physics is the science of the fundamental concepts of field, force, radiation and particle structures, which are inter-linked to form unified models of the behavior of the material universe. From such models, a wide range of ideas, from the broadest issue of the development of the universe over time to the numerous and detailed ways in which new technologies may be invented, have emerged. These have enriched both our basic understanding of, and our many adaptations to, our material environment. Students should be helped to understand how, through the ideas of physics, the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas which are of universal application.

Students should acquire sufficient knowledge and understanding to basic themes in physics, they should become confident citizens in a technological world and develop an informed interest in scientific matters. Students should recognize that science including physics is evidence based and understand the usefulness, and the limitations, of scientific method. Students should also develop skills that are relevant to the study and practice of physics and that are useful in everyday life. Students will be encouraged to solve physical problems on their own and to communicate effectively about it through the language of science. Students should also to develop attitudes relevant to physics such as concern for accuracy and precision, objectivity, integrity, enquiry, initiative and inventiveness. Students will be encouraged to appreciate that science is subject to social, economic, technological, ethical and cultural influences and limitations and that the applications of science may be both beneficial and detrimental to the individual, the community and the environment.

## Physics (Course Objectives)

### i) Motion

- Define speed and calculate average speed
- Plot and interpret a speed-time graph or a distance-time graph
- Calculate the area under a speed-time graph to work out the distance travelled for motion with constant acceleration
- Demonstrate understanding that acceleration and deceleration are related to changing speed including qualitative analysis of the gradient of a speed-time graph
- State that the acceleration of free fall for a body near to the Earth is constant

### ii) Mass and Weight

- Distinguish between mass and weight
- Recall and use the equation  $W = mg$
- Demonstrate understanding that weights (and hence masses) may be compared using a balance

### iii) Density

- Recall and use the formula for density
- Describe an experiment to determine the density of a liquid and of a regularly and an irregularly shaped solid and make the necessary calculation
- Predict whether an object will float based on density data

### iv) Forces

- Recognize that a force may produce a change in size and shape of a body

- Plot and interpret extension-load graphs and describe the associated experimental procedure
- Describe the ways in which a force may change the motion of a body
- Find the resultant of two or more forces acting along the same line
- Recognize that if there is no resultant force on a body it either remains at rest or continues at constant speed in a straight line
- Understand friction as the force between two surfaces which impedes motion and results in heating
- Recognize air resistance as a form of friction

**v) Turning Effect of a Force**

- Describe the moment of a force as a measure of its turning effect and give everyday examples
- Understand that increasing force or distance from the pivot increases the moment of a force
- Calculate moment using the product force  $\times$  perpendicular distance from the pivot
- Apply the principle of moments to the balancing of a beam about a pivot
- Recognize that, when there is no resultant force and no resultant turning effect, a system is in equilibrium
- Perform and describe an experiment to determine the position of the center of mass and describe qualitatively the effect of the position of the center of mass on the stability of simple objects

## **vi) Energy**

- Identify changes in kinetic, gravitational potential, chemical, elastic (strain), nuclear and internal energy that have occurred as a result of an event or process
- Recognize that energy is transferred during events and processes, including examples of transfer by forces (mechanical working), by electrical currents (electrical working), by heating and by waves
- Apply the principle of conservation of energy to simple examples
- Describe how electricity or other useful forms of energy may be obtained from various resources
- Give advantages and disadvantages of each method of electricity production in terms of renewability, cost, reliability, scale and environmental impact
- Calculate efficiency of energy transfer

## **vii) Work**

- Demonstrate understanding that work done = energy transferred
- Relate work done to the magnitude of a force and the distance moved in the direction of the force
- Relate power to work done and time taken, using appropriate examples

## **viii) Pressure**

- Recall and use the formula for pressure.
- Relate pressure to force and area, using appropriate examples
- Describe the simple mercury barometer and its use in measuring atmospheric pressure

- Relate the pressure beneath a liquid surface to depth and to density, using appropriate examples
- Use and describe the use of a manometer

## **ix) Thermal Physics**

- State the distinguishing properties of solids, liquids and gases
- Describe qualitatively the molecular structure of solids, liquids and gases in terms of the arrangement, separation and motion of the molecules
- Interpret the temperature of a gas in terms of the motion of its molecules
- Describe qualitatively the pressure of a gas in terms of the motion of its molecules
- Show an understanding of the random motion of particles in a suspension as evidence for the kinetic molecular model of matter
- Describe this motion (sometimes known as Brownian motion) in terms of random molecular bombardment
- Describe and relate evaporation to the consequent cooling of the liquid
- Describe qualitatively, in terms of molecules, the effect of a change of temperature at constant volume and an effect of a change of volume at constant temperature on the pressure of a gas
- Describe qualitatively the thermal expansion of solids, liquids, and gases at constant pressure and identify and explain some of the everyday applications and consequences of thermal expansion
- Appreciate how a physical property that varies with temperature may be used for the measurement of temperature, and state examples of such properties

- Relate a rise in the temperature of a body to an increase in its internal energy and show an understanding of what is meant by the thermal capacity of a body
- Describe melting and boiling in terms of energy input without a change in temperature
- State the meaning of melting point and boiling point
- Describe condensation and solidification in terms of molecules
- Explain conduction and describe experiments to demonstrate the properties of good and bad thermal conductors
- Recognize convection as an important method of thermal transfer in fluids and relate convection in fluids to density changes
- Recognize that thermal energy transfer by radiation does not require a medium
- Describe the effect of surface color and texture on the emission, absorption and reflection of radiation
- Identify and explain some of the everyday applications and consequences of conduction, convection and radiation

**x) General Wave Properties**

- Demonstrate understanding that waves transfer energy without transferring matter
- Describe what is meant by wave motion
- Give the meaning of speed, frequency, wavelength and amplitude
- Distinguish between transverse and longitudinal waves and give suitable examples
- Describe the use of water waves to demonstrate reflection, refraction and diffraction

## **xi) Light**

- Describe the formation of an optical image by a plane mirror, and give its characteristics
- Recall and use the law angle of incidence = angle of reflection
- Describe an experimental demonstration of the refraction of light
- Use the terminology for the angle of incidence  $i$  and angle of refraction  $r$  and describe the passage of light through parallel-sided transparent material
- Give the meaning of critical angle
- Describe internal and total internal reflection
- Describe the action of a thin converging lens on a beam of light
- Use the terms principal focus and focal length
- Draw ray diagrams for the formation of a real image by a single lens
- Describe the nature of an image using the terms enlarged/same size/diminished and upright/inverted
- Give a qualitative account of the dispersion of light
- Describe the main features of the electromagnetic spectrum in order of wavelength and describe typical properties and uses of radiations in all the different regions of the electromagnetic spectrum

## **xii) Sound**

- Describe the production of sound by vibrating sources
- Describe the longitudinal nature of sound waves
- State the approximate range of audible frequencies for a healthy human
- Show an understanding of the term ultrasound

- Show an understanding that a medium is needed to transmit sound waves
- Describe an experiment to determine the speed of sound in air
- Relate the loudness and pitch of sound waves to amplitude and frequency
- Describe how the reflection of sound may produce an echo

## **Geography (Course Description)**

In Grade 9, students begin Key Stage 4 and begin to work toward their IGCSE qualification in Geography. The curriculum aims to develop: an understanding of location on a local, regional and global scale; an awareness of the characteristics, distribution and processes affecting contrasting physical and human environments; an understanding of the ways in which people interact with each other and with their environment; an awareness of the contrasting opportunities and constraints presented by different environments; an appreciation of and concern for the environment; and an appreciation of the earth including its people, places, landscapes, natural processes and phenomena.

During Grade 9, the focus of study concerns the following topic areas: Population Dynamics; Settlements; Place Tectonics; Weathering; River Processes and Landforms; and Marine Processed and Landforms.

## **Geography (Course Objectives)**

### **i) Population Dynamics**

- Change in population growth
- Migration
- Demographic transition
- Population pyramids
- Mexico and Japan
- China and Iran
- Population Density and Distribution

### **ii) Settlements**

- Hierarchy of settlements
- Rural settlements
- Urban settlements
- Problems and urban area

### **iii) Plate Tectonics**

- Plate boundaries
- Volcanoes
- Earthquakes

### **iv) Weathering**

- What is weathering?

- Physical weathering
- Chemical weathering
- Rock types and weathering
- Climate and weathering

**v) River Processes and Landforms**

- River processes
- River courses
- Flooding
- Pakistan
- Australia
- Flood prevention

**vi) Marine Processes and Landforms**

- Coasts and waves
- Marine erosion, transport and deposition
- Landforms created by erosion
- Landforms created by deposition
- Grand Cayman Salt Marches
- Coastal sand dunes
- Coral reefs
- Fiji

## **Global Perspectives (Course Description)**

Young people face unprecedented challenges in an interconnected and information-heavy world, not least in how they will gain a sense of their own active place in the world and cope with changes that will impact on their life chances and life choices.

Students of Global Perspectives will have opportunities to acquire and apply a range of skills to support them, including: researching, analysing and evaluating information • developing and justifying a line of reasoning; reflecting on processes and outcomes; communicating information and reasoning; and collaborating to achieve a common outcome. Candidates explore stimulating topics that have global significance. They learn to collaborate with others from another culture, community or country. They assess information critically and explore lines of reasoning. They learn to direct their own learning and develop an independence of thought.

## **Global Perspectives (Course Objectives)**

### **i) Skills Development**

- Searching for Information
- Reading and Recording
- Setting up Research
- Identifying information and trends
- Understanding key issues
- Identifying causes and consequences
- Identifying and evaluating possible courses of action
- Identifying different perspectives
- Questioning knowledge claims
- Questioning the reliability of information
- Evaluating causes and consequence
- Questioning underlying beliefs
- Developing a line of reasoning
- Reflecting on issues and perspectives
- Reflection on teamwork, outcomes and own performance
- Reflect on personal learning
- Planning a project
- Teamwork and individual effort
- Select evidence and present research

### **ii) Individual Report**

- Belief Systems
- Project Preparation

- Individual Research
- Peer Edit and Review

**iii) Group Project**

- Conflict and Peace
- Project Preparation
- Group Research
- Peer Edit and Review
- Group Presentation

**iv) Written Examination Practice**

- Demographic Change
- Practice Examination: Demographic Change

## **History (Course Description)**

In Grade 9, students begin Key Stage 4 and begin to work toward their IGCSE qualification in History. The curriculum aims to: stimulate an interest in and enthusiasm for learning about the past; promote the acquisition of knowledge and understanding of individuals, people and societies in the past; ensure that learners' knowledge is rooted in an understanding of the nature and use of historical evidence; promote an understanding of key historical concepts: cause and consequence, change and continuity, and similarity and difference; provide a sound basis for further study and the pursuit of personal interest; encourage international understanding; and encourage the development of historical skills, including investigation, analysis, evaluation and communication skills.

The content of Grade 9 focuses on the following Key Questions:

- Were the peace treaties of 1919–23 fair?
- To what extent was the League of Nations a success?
- Why had international peace collapsed by 1939?
- Who was to blame for the Cold War?

## History (Course Objectives)

### i) Were the peace treaties of 1919 – 1923 fair?

- What were the motives and aims of the Big Three at Versailles?
- Why did all the victors not get everything they wanted?
- What was the impact of the peace treaty on Germany up to 1923?
- Could the treaties be justified at the time?
- The peace treaties of 1919 – 1923:
  - The role of individuals such as Wilson, Clemenceau and Lloyd George in the peacemaking process
  - The impact of the treaties on the defeated countries
  - Contemporary opinions about the treaties

### ii) To what extent was the League of Nations a success?

- How successful was the League in the 1920s?
- How far did weaknesses in the League's organisation make failure inevitable?
- How far did the Depression make the work of the League more difficult?
- How successful was the League in the 1930s?
- The League of Nations:
  - strengths and weaknesses in its structure and organisation: work of the League's agencies/ humanitarian work
  - successes and failures in peacekeeping during the 1920s

- the impact of the World Depression on the work of the League after 1929
- the failures of the League in the 1930s, including Manchuria and Abyssinia

### **iii) Why had international peace collapsed by 1939?**

- What were the long-term consequences of the peace treaties of 1919–23?
- What were the consequences of the failures of the League in the 1930s?
- How far was Hitler's foreign policy to blame for the outbreak of war in 1939?
- Was the policy of appeasement justified?
- How important was the Nazi–Soviet Pact?
- Why did Britain and France declare war on Germany in September 1939?
  - The collapse of international order in the 1930s
  - The increasing militarism of Germany, Italy and Japan
  - Hitler's foreign policy to 1939:
    - the Saar – remilitarisation of the Rhineland – Involvement in the Spanish Civil War – Anschluss with Austria – appeasement – crises over Czechoslovakia and Poland – the outbreak of war

### **iv) Who was to blame for the Cold War?**

- Why did the USA–USSR alliance begin to break down in 1945?
- How had the USSR gained control of Eastern Europe by 1948?
- How did the USA react to Soviet expansionism?

- What were the consequences of the Berlin Blockade?
- Who was the more to blame for starting the Cold War: the USA or the USSR?
- The origins of the Cold War:
  - the 1945 summit conferences and the breakdown of the USA–USSR alliance in 1945–46
  - Soviet expansion into Eastern Europe to 1948, and American reactions to it
  - the occupation of Germany and the Berlin Blockade
  - NATO and the Warsaw Pact

## **Information Technology (Course Description)**

In Grade 9, students begin Key Stage 4 and begin to work toward their IGCSE qualification in Information Technology. The curriculum aims to develop: knowledge of ICT including new and emerging technologies; autonomous and discerning use of ICT; skills to enhance work produced in a range of contexts skills to analyse, design, implement, test and evaluate ICT systems; skills to consider the impact of current and new technologies on methods of working in the outside world and on social, economic, ethical and moral issues; ICT-based solutions to solve problems; and the ability to recognise potential risks when using ICT, and use safe, secure and responsible practice.

All pupils must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career. All pupils should be taught to: develop their capability, creativity and knowledge in computer science, digital media and information technology; develop and apply their analytic, problem-solving, design, and computational thinking skills; understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.

## **Information Technology (Course Objectives)**

### **i) Hardware Devices**

- Cloud computing
- Components
- Input and output devices
- Storage devices

### **ii) Computer Networks**

- Network topology
- Internet and intranet
- Network devices
- Authentication techniques
- Video and teleconferencing

### **iii) Word Processing Techniques**

- Microsoft Word processing sessions

### **iv) Computer Systems and Components**

- Hardware vs Software
- RAM and ROM
- Examples of devices
- Input and output
- Processing
- Storage

**v) Document Production**

- Evidence shots
- Practical paper database
- Database design
- MS Access

**vi) Databases**

- Multiple criteria queries
- BSOD fan database

**vii) Spreadsheets**

- Using SUM
- Simple formulae and formatting

**viii) HTML Production**

- Practical applications of CSS
- HTML files
- Theory: content versus layout

## **Business Studies (Course Description)**

Grade 9 students are eligible to study Business Studies for the first time. A new subject, during the Grade 9 academic year the aims of the Business Studies curriculum are to enable candidates to: make effective use of relevant terminology, concepts and methods, and recognise the strengths and limitations of the ideas used in business; apply their knowledge and critical understanding to current issues and problems in a wide range of business contexts; distinguish between facts and opinions, and evaluate qualitative and quantitative data in order to help build arguments and make informed judgements; appreciate the perspectives of a range of stakeholders in relation to the business environment, individuals, society, government and enterprise; develop knowledge and understanding of the major groups and organisations within and outside business, and consider ways in which they are able to influence objectives, decisions and activities; develop knowledge and understanding of how the main types of businesses are organised, financed and operated, and how their relations with other organisations, consumers, employees, owners and society are regulated; develop skills of numeracy, literacy, enquiry, selection and use of relevant sources of information, presentation and interpretation; and to develop an awareness of the nature and significance of innovation and change within the context of business activities.

## **Business Studies (Course Objectives)**

### **i) Understanding Business Activity**

- Business activity
- Classification of businesses
- Enterprise, business growth and size
- Types of business organisation
- Business objectives and stakeholder objectives

### **ii) People in Business**

- Motivating workers
- Organisation and management
- Recruitment, selection and training of worker
- Internal and external communication

### **iii) Marketing**

- Marketing, competition and the customer
- Market research
- Marketing mix
- Marketing strategy

### **iv) Operations management**

- Production of goods and services
- Costs, scale of production and break-even analysis
- Achieving quality production

- Location decisions

**v) Financial information and decisions**

- Business finance: needs and sources
- Cash-flow forecasting and working capital
- Income statements
- Balance sheets
- Analysis of accounts

**vi) External influences on business activity**

- Government economic objectives and policies
- Environmental and ethical issues
- Business and the international economy

## **Modern Language (Course Description)**

In Grade 9, students begin Key Stage 4 and begin to work toward their IGCSE qualification in a specific Modern Language. The curriculum aims to: develop the ability to communicate effectively using the target language; offer insights into the culture and society of countries where the language is spoken; develop awareness of the nature of language and language learning; encourage positive attitudes towards speakers of other languages and a sympathetic approach to other cultures and civilisations • provide enjoyment and intellectual stimulation; develop transferable skills (e.g. analysis, memorising, drawing of inferences) to complement other areas of the curriculum; and to form a sound base of the skills, language and attitudes required for progression to work or further study, either in the target language or another subject area.

The subject content is organised around five broad topic areas which provide contexts for the acquisition of vocabulary and the study of grammar and structures. Through the study of these Topic areas, candidates gain insight into target language countries and communities. The Topic areas are:

- Everyday activities
- Personal and social life
- The world around us
- The world of work
- The international world

## **Modern Language (Course Objectives)**

### **i) Everyday Activities**

- Home life and school
- Food, health and fitness
- Home life
- School routine
- Eating and drinking
- Health and fitness

### **ii) Personal and Social Life**

- Self, family and personal relationships
- Holidays and special occasions
- Self, family, pets, personal relationships
- House and home
- Leisure, entertainments, invitations
- Eating out
- Festivals and special occasions
- Holidays; getting around
- Accommodation

### **iii) The World Around Us**

- Home town and local area
- Natural and made environment
- People, places and customs

- Home town and geographical surroundings
- Shopping Public services
- Natural environment
- Weather Finding the way
- Meeting people Places and customs
- Travel and transport

#### **iv) The World of Work**

- Continuing education
- Careers and employment
- Language and communication in the work place
- Further education and training
- Future career plans
- Employment
- Communication Language at work

#### **v) The International World**

- Tourism at home and abroad
- Life in other countries and communities
- World events and issues
- Holiday travel and transport
- Geographical surroundings
- Weather
- Places and customs

- Food and drink
- Meeting people
- Issues according to available resources and individual interest

## **Physical Education (Course Description)**

A high-quality physical education curriculum inspires all pupils to succeed and excel in competitive sport and other physically-demanding activities. It should provide opportunities for pupils to become physically confident in a way which supports their health and fitness. Opportunities to compete in sport and other activities build character and help to embed values such as fairness and respect.

During Grade 9, pupils will be encouraged to: develop competence to excel in a broad range of physical activities; are physically active for sustained periods of time; engage in competitive sports and activities; and to lead healthy, active lives.

## **Physical Education (Course Objectives)**

Pupils should tackle complex and demanding physical activities. They should get involved in a range of activities that develops personal fitness and promotes an active, healthy lifestyle.

Pupils should be taught to:

- Use and develop a variety of tactics and strategies to overcome opponents in team and individual games [for example, badminton, basketball, cricket, football, hockey, netball, rounders, rugby and tennis]
- Develop their technique and improve their performance in other competitive sports, [for example, athletics and gymnastics], or other physical activities [for example, dance]
- Take part in further outdoor and adventurous activities in a range of environments which present intellectual and physical challenges and which encourage pupils to work in a team, building on trust and developing skills to solve problems, either individually or as a group
- Evaluate their performances compared to previous ones and demonstrate improvement across a range of physical activities to achieve their personal best
- Continue to take part regularly in competitive sports and activities outside school through community links or sports clubs.

## **Economics (Course Description)**

In Grade 9, students begin Key Stage 4 and begin to work toward their IGCSE qualification in Economics. The curriculum aims to assist candidates to gain lifelong skills, including: an understanding of economic theory, terminology and principles • the ability to apply the tools of economic analysis; the ability to distinguish between facts and value judgements in economic issues; an understanding of, and an ability to use, basic economic numeracy and literacy; the ability to take a greater part in decision-making processes in everyday life; an understanding of the economies of developed and developing nations; and an excellent foundation for advanced study in economics.

## **Economics (Course Description)**

### **i) The Basic Economic Problem: Choice and the Allocation of Resources**

- The basic economic question
- Factors of production
- The satisfaction of human wants
- Opportunity costs
- Production Possibility Curves

### **ii) The Allocation of Resources: how markets work; market failure**

- Economic systems
- Market economic systems
- Mixed economic systems
- Private and Public Expenditures
- Product Demand
- Causes of increases and decreases in demand
- Product Supply
- Causes of increases and decreases in supply
- Market price
- Price elasticity of demand
- Price elasticity of supply
- The impact of taxes and subsidies on market outcomes
- How the decision of firms can affect others
- Social costs and benefits
- Market failure and government intervention

- Conservation or commercialization?

### **iii) The Individual as Producer, Consumer and Borrower**

- Why do we need money?
- What makes a good money?
- The history of money / What is money?
- The money market
- The stock market
- Why do people work?
- What is the labour market?
- The market wage for a job
- Why do the earnings of employees differ?
- Why do governments intervene in labour markets?
- What is a trade union?
- Collective bargaining
- Consumption
- Saving
- Borrowing money

### **iv) The Private Firm as Producer and Employer**

- Starting a business
- Sole Trader, Joint-stock companies
- Multinational corporations
- Cooperatives
- Production

- The aims of production
- Calculating costs and revenues
- Profit, loss or break-even
- The size of firms
- How firms grow in size
- The relationship between costs and productive scale

**v) Competition**

- Why do firms compete?
- Pricing strategies
- What is a market structure?
- Monopolies

**vi) Role of Government in an Economy**

- The government as an employer, consumer and producer
- Macroeconomic objectives
- Demand-side policies
- Supply-side policies
- Policy conflicts
- Financing public expenditure
- Tax systems
- Direct taxes
- Indirect taxes
- Balancing the budget

**vii) Economic Indicators**

- What is inflation?
- What is deflation?
- Employment trends
- The causes and consequences of unemployment
- Measuring output / GDP
- Economic growth
- Growth cycles

**viii) Developed and Developing Economies: Trends in Production, Population and Living Standards**

- Economic development in different economies
- Development indicators
- Measures to reduce international poverty
- The global population
- Causes of population change
- The structure of populations

**ix) International Aspects**

- Globalization and trade
- International trade patterns
- Free trade or protectionism?
- Exports and imports
- The balance of payments
- Exchange rates
- Correct trade imbalance

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