

GERMAN SCHOOL NAIROBI

CURRICULUM OVERVIEW

MATHEMATICS, BIOLOGY, CHEMISTRY, PHYSICS

(GRADES 5 – 9)

Please note that this summary of the curriculum overview is simply to give the parents of the scholarship students a small insight into the topics covered in each class in the subjects mentioned. It does not include a detailed syllabus, as it is meant to be used as an informal guideline.

MATHEMATICS

Class 5

- Data, rounding (off) numbers, drawing diagrams
- Calculating with whole numbers; converting measurements
- Symmetry
- (Written) addition, subtraction, multiplication, division
- Surface unit of measure, area & circumference
- Field: nets, axonometric projection, three-dimensional domain (volume)
- Negative numbers

Class 6

- Divisibility of whole numbers
- Fractions
- Angles in circles and triangles
- Negative numbers

Class 7

- Functional attribution / proportionality
- Percentage & interest (rates)
- Relative frequency & probability
- Rational numbers (negative numbers and calculating with rational numbers)
- Congruency (triangles & quadrangles); perpendicular bisector; bisecting line of an angle; circumscribed & inscribed circles of triangles
- Terms with variables, solving equations & inequalities
- Area of parallelograms, triangles, trapeziums, polygons
- Prisms; Three-dimensional domain (volume) & area of surface of prisms

Class 8

- Terms and formulae (linear and simple quadratic equations and inequalities)
- Linear functions and equations
- Powers and roots
- Circle (tangents, chords, passant, ρ)
- Probability
- Pythagoras Theorem and solids (cylinder, sphere etc.)

Class 9

- Linear set of equations
- Centric elongation
- Quadratic equations and functions
- Rules of powers (squared etc.)
- Probability

BIOLOGY

Class 5

- What is Biology?
- Mammals in their habitat
 - Mammals such as cats, dogs, elephants, cattle
 - Conformity of their body and behaviour in their habitat
 - Keeping of animals in an species-appropriate environment
- The human body
 - Conformation and functioning of bones, skeleton, muscles, joints
 - Nutrition
 - Senses
- I am becoming an adult
 - Development and changes of the human body during adolescence

Class 6

- Vertebrates in their habitat
 - Fish, birds, reptiles, amphibians
 - Describing the way of living and conclude with typical characteristics
- Invertebrates in their habitat
 - Insects
 - Worms
 - Snails
 - Finding typical characteristics
 - Metamorphosis of specific beetles
 - Hygiene concerning the protection from Parasites
- Conformation of flowering plants
 - Functioning of the organs of plants
 - Photosynthesis

Class 7

- Other Invertebrates in the ocean
 - Echinodermata
 - Mollusca
 - Describing and observing Invertebrates
- Parasites
- Non-flowering Plants
 - Moss
 - Fern
- Adolescence
 - Changes of the body, character, mind and social network during adolescence

Class 8

- Light microscopy
 - Correct use of microscopes and easy apparatus under supervision
- From cells to organisms
 - Hierarchy of cells, tissue, organs and systems
- Life threatening diseases (Viruses, AIDS)
 - Descriptions of how viruses are activated, how they spread, and how the body's immune system fights them.
- Fungi and lichen
 - Observation, description and comparison of fungi
- Drugs and addiction (legal and illegal drugs)
 - Health risks from the consumption of drugs
 - Say No!
- Sexuality, reproduction in humans
 - Menstruation cycle
 - Contraception

Class 9

- Metabolism in humans
 - Healthy nutrition
- Musculoskeletal system in humans
 - Skeleton
 - Muscles
- Human genetics
 - Genotype and phenotype
 - Heredity according to Mendel model
- Hormonal system in humans
- The Human Body and maintenance of a healthy body
 - Sensory organs
 - Eyes (structure and function)
 - Operating principles of the sensory organs – electric signals
 - Structure of the nervous system
 - Basic descriptions of the peripheral, central and vegetative
 - Nervous system disorders and disease (brain, function etc.)

CHEMISTRY

Class 7

- Introduction to Chemistry
 - Security in the laboratory
- Matter and its properties
- Experiments with matter
- The physical properties of matter (melting temperatures, boiling points, ..., conduction of electricity, density, solubility)
- Classification of matter: metals / non-metals, salts, volatile compounds)
- Mixing and separating
 - Experiments / observation, / recording
 - Definitions (suspensions, smoke, solutions, emulsions, different mixtures (homogenic / heterogenic)
- Chemical reactions
 - Recognition of reactions through physical processes (describe reactions)
 - definition of chemical reactions (exothermic, endothermic reactions)
- Combustion of air and oxygen
 - Components of air / oxygen content of air, properties of oxygen
 - Oxidisation
- Prevention of fire and fire fighting
 - Describe and compare processes of extinguishing fires, ignition temperatures, types of fire

Class 8

- Air, oxygen and oxides
 - combustion, still oxidation, reduction, redox reaction, acids (acidic), bases (alkaline), glowing splint test
- Chemical formulae
 - Use of symbols for chemical, description of qualitative and quantitative meanings of formulae, molecule formulae, establishing formulae
- Quantitative relations
 - Atomic mass, molar mass, quantity of matter, concentration, molar volume, mass-laws, DALTON atomic hypothesis

- Chemical Equations
- Water and properties of water
 - Oxyhydrogen test, decomposition, water catalyser
- Element group of alkali metals and halogens
 - Alkali metals, sodium hydroxide, halogens
- Classification of elements
 - Atomic number, atomic weight, main group, period

Class 9

- Elements and compounds, and the periodic table
- Chemical bonding
 - Formation and structure of molecules,
 - ionic bonding
 - covalent bonding,
 - single, double, triple bonding
 - bond angles of CO₂, NH₃, H₂O
 - electronegativity table
 - polar atomic bonding
- Quantitative relations
 - Calculations of molar mass with the mass number of atoms
 - Moles, molar mass
 - Stoichiometry
- Acids, bases and salts
 - PH-Scale
 - Formulating equations
 - Phosphate
 - Chemical fertilisers in agriculture
- Redox reactions
 - Electrolysis
 - Oxidation and reductions

PHYSICS

Class 7

- Introduction to Physics
- The body and its characteristics
 - Volume, mass
 - Density
 - Temperature as a physical quantity
 - Expansion through heating

- Forces and an introduction to kinematics
 - Speed and acceleration
 - Balance of forces
 - Direction of force, force application point
 - Force as cause of motion
 - Force as a product of mass and acceleration (Newton)
 - Gravity, electrical force, rules of action and reaction
 - Acceleration and weight
 - Magnetic forces

- Electricity
 - Electrical power
 - Description of electrical circuits
 - Differentiate conductors and non-conductors
 - Current flow in metals
 - Differentiate between series and parallel linking of elements

- Optics

- Linear dispersion of light
 - Light and shadows
 - Phases of the moon, sun and eclipses

- Reflection of light
 - Reflections and mirror images
 - Refraction
 - Absorption

- Colours
 - Separation of white light
 - Rainbows

Class 8

- Energy as a conserved quantity
 - Different forms of energy
 - Principle of energy conservation
 - Types of energy in mechanics

- Resistors in simple safety circuits
 - Ohm's Law
 - Series and parallel connections
- Electrical energy and power
 - Relationship between amperage, charge and elementary charge
 - Turning electrical energy into other forms of energy
 - Relationship between electric power, voltage and amperage
- Energy conservation
 - Responsible use of energy
 - Environmental issues and the future
- Thermodynamics
 - Thermal capacity
 - Mathematical equation, $e=mc_2$

Class 9

- Electric / electromagnetic interaction
 - Electrical and magnetic fields, through field lines
 - Forces on current carrying conductors
 - Electric motors
 - Induction
 - Generators / transformers ,power plants, high voltage lines
- Atoms and Nuclei
 - Structure of atoms
 - Absorption and supply of energy
 - Radiation and radioactive nuclides
 - Nuclear conversions
- Axial linear motion