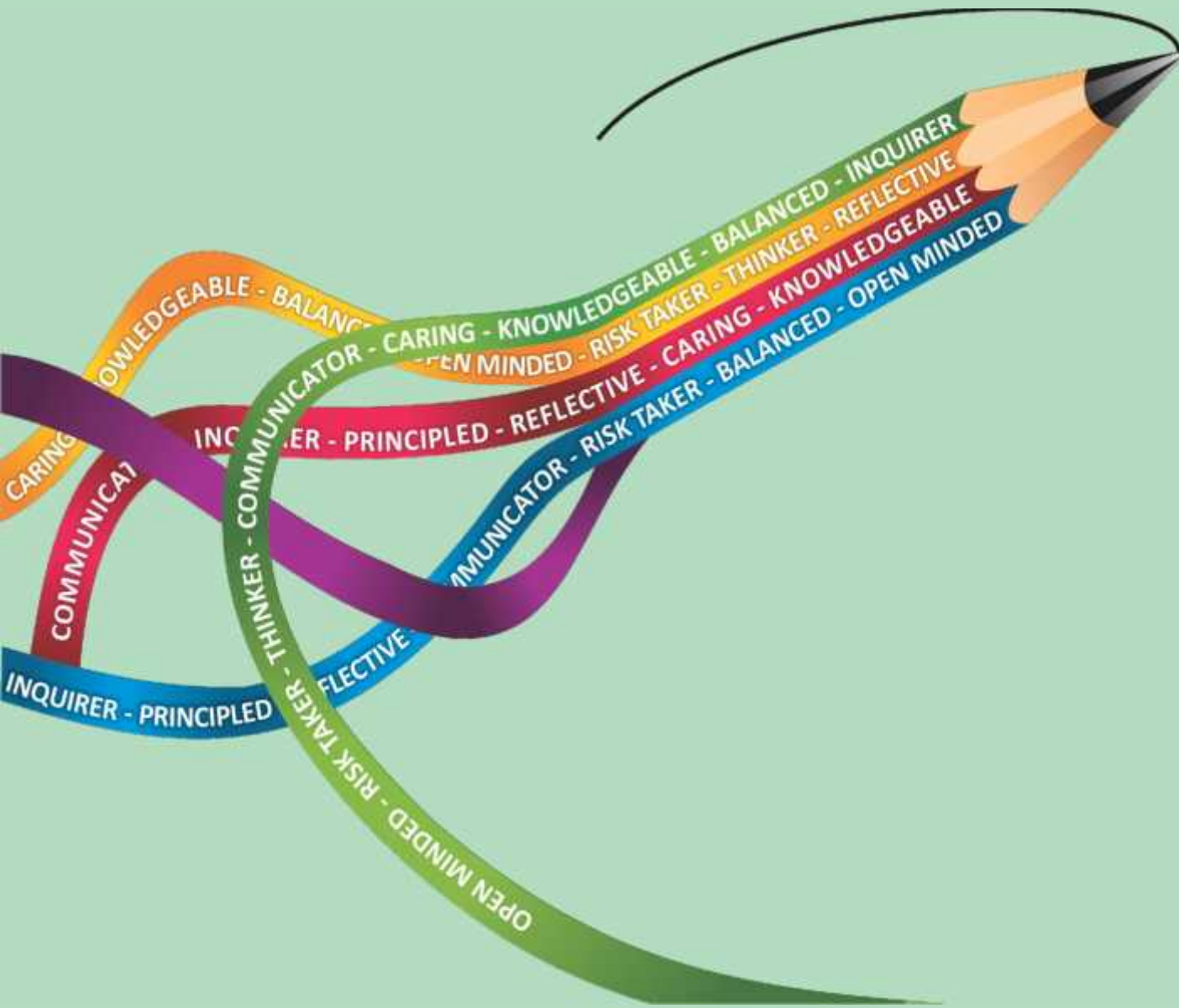


Sciences - SGO



MYP 1- BIOLOGY

| MYP YEAR 1 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY) | | | | | | | |
|---|---------------|--------------------|--|--|--|--|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Cell and characteristics of living organisms 20 sessions @ 40 min | Relationships | Form , Function | Identities and relationships Exploration Identity of cell, its role in living organism. | Investigating a theory helps to understand the form and function of its elements and their mutual relationships. | Objective A Knowing and understanding | Thinking Critical. Creative LP: Thinker | 1- The use of microscope. 2- The cell as the basic unit of life. 3- Cells arise from pre-existing cells. 4- Basic parts of cell- different parts and their functions 5-Plant cell and animal cell- their differences 6- Adaptations in cell- different types of specialized cells. 7- Cells, tissues, organs, organ systems (e.g.: skeletal and muscle system introduction) and organisms. 8- Living things (organisms) share the common qualities of movement, reproduction, sensitivity, growth, respiration, elimination and nutrition. Connection- Art (ratio of individual parts in drawing diagrams) |
| Classification and adaptation of living things in their environment 30 sessions @ 40 min | Systems | Forms, Patterns | Orientation in time and space Exploration- History of classification and evolution of organisms | The laws of the natural world that evolved during time, support to establish relationships between individuals in a system through their patterns and forms. | Objective D Reflecting on the impacts of science | Self-management : Organization Research Information literacy LP- Inquirer, Knowledge able, Principled. | 1- Adaptations are the characteristics that help organisms to survive. 2- Adaptations may be behavioral or structural. 3-Characteristics of living organisms 4- How is classification system made and developed?5-Classification systems are practical tools for scientists to communicate with one another. 6-Classification is the grouping and naming of organisms based on their shared characteristics. 7- Division of organisms into five kingdoms. 8- The animal kingdom. 9-The plant kingdom 10- Organisms that can reproduce with one another and produce fertile offspring are members of the same species 11- Binomial nomenclature involves a two-name system. Each two- word name is unique and originates from Latin, with only the genus capitalized (for example, Homo sapiens) 12-Using and constructing dichotomous keys to classify a group of organisms or objects Connection- Language and Literature (Essay on Evolution of Classification System) |

| | | | | | | | |
|---|--------|------------------------------|--|--|--|---|---|
| Microorganisms 30 sessions @ 40 min | Change | Consequences, Interaction | Scientific and technical innovation Exploration: Advances of technology is a result of the interaction between human and the microbial world. | Scientific and technical innovation is a consequence of change and interactions in a system. | Objective B: Inquiring and designing Objective C: Processing and evaluating Objective D Reflecting on the impacts of science | Collaboration, Critical Transfer. LP- Thinker, Open-minded, Caring | 1- Definition of the terms “disease”, “infectious”/ “communicable”, “micro-organism” and “pathogen” 2- Identification of fungi, bacteria and viruses as pathogenic microorganisms. 3- Reproduction in fungi, bacteria and viruses. 4- Main biological and structural differences between fungi, bacteria and viruses. • Scientific drawing skills. 5- Defense mechanism, Infectious diseases and the problems they cause with specific reference to: fungal diseases (for example, athlete’s foot, ringworm) bacterial diseases, viral diseases. 6- Role of vaccines. Service as Action- Activity on Health and Hygiene. Learning Outcome- Work collaboratively with others. Undertake challenges that develop new skills. |
|---|--------|------------------------------|--|--|--|---|---|

MYP 1- CHEMISTRY

MYP YEAR 1 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY)

| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
|--|---------------|--------------------|---|---|---|--|--|
| Atoms and Elements 20 sessions @40 min | Relationships | Form Models | Orientation in space and time Area of Exploration- Evolution of Atomic structure | The relationships between Form and models are observed as they orient in space and time. | Objective A: Knowing and Understanding Objective D- Reflecting on Impacts of Science | Thinking Skills- Critical Research Skills: Information Literacy Learner Profile: Thinker Knowledgeable | 1. The history of atomic structure and the evolution of the recent atomic structure. 2. What is the atom made up of? 3. What is atomic number, atomic mass number 4. Electron shells and elements from atomic number 1 to 20 Service As Action- MODEL MAKING OF ATOMS Learning outcome- Becoming aware of strengths and weaknesses, new skills, collaborative work. |
| Material Properties 40 sessions @40 min | Change | Patterns Evidence. | Scientific and technical innovation Area of Exploration : Chemical Products, processes and solutions in everyday life. | Scientific and technical innovations support identification of patterns involved in a change. | Objective B: Inquiring and Designing Objective C: Processing and Evaluating Objective D- Reflecting on Impacts of Science | Communication Skill Learner Profile: Communicator | 1-Differentiate between elements and compounds. 2. What are acids and alkalis, the concept of pH, neutralization? Acid rain and its causes and effects, measures to prevent. 3. Investigation of materials in everyday life based on the physical properties and the application of the same. SERVICE AS ACTION: Measuring the pH of the school swimming pool water and advising the staff for its maintenance. Learning outcome- collaborative work, discuss, evaluate and plan the activity. |

| | | | | | | | |
|---|---------------|-----------------|---|--|--|--|--|
| States of matter 20 sessions @40 min | Relationships | Form Conditions | Identities and Relationships Area of Exploration: Transitions of different states of matter | Materials in different forms exhibit relationships retaining their individual identities under various conditions. | Objective A: Knowing and Understanding Objective B Inquiring and Designing. | Thinking Skills-Creative Learner Profile: Thinker | 1. The different states of matter and application of the particle theory for its study. 2. Solute, solvent and solution. 3. The difference between soluble and insoluble, miscible and immiscible. 4. The study of different process like melting, evaporation, boiling, sublimation and diffusion. 5. The concept of pure and impure substance. Connection with Math: Apply mathematical formula to convert different units of measurement of temperature. Activity: Conduct lab experiments to study the different states of matter. |
|---|---------------|-----------------|---|--|--|--|--|

MYP 1- PHYSICS

| MYP YEAR 1 INTEGRATED SCIENCES (DRAWN FROM PHYSICS) | | | | | | | |
|---|---------------|---------------------------|--|--|--|--|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Force and Motion 40 sessions @ 40 min. | Relationships | Movements Consequences | Scientific and technical innovation Area of exploration - Products, processes and solutions. | Relationship between movement and its consequences have resulted in scientific and technical innovation. | A: Knowledge and Understanding B: Inquiring and Designing | Thinking Skills - Creative, Critical Learners Profile: Reflective Knowledgeable | 1-Introduction to Motion 2. Effects of force 3. Types of forces 4. Contact Force, Non-contact Forces, 5 Friction, definition, Advantages and disadvantages of friction, 6. Air and water resistance 7. Mass and Weight, Gravitational Force and Weightlessness. 8 Gravity, 9. Introduction to Newton's Law of Motion. Connections: With PE and Mathematics Service as Action – Demonstration of friction using different types of surfaces. Learning outcome- developing new skills, working in collaboration. |

| | | | | | | | |
|--|---------------|------------------------------------|---|---|--|---|--|
| <p>Energy and Energy Transfers</p> <p>40 sessions @ 40 min</p> | <p>Change</p> | <p>Energy, Transformation Form</p> | <p>Globalization and Sustainability Area of exploration- Human impact on the environment</p> | <p>Humankind and the environment are affected by energy being transformed into different forms.</p> | <p>B: Inquiring and Designing : C: Processing and Evaluating : D: Reflecting on the impacts of science</p> | <p>Communication Research Skills Literacy skills : Learners Profile: Knowledgeable Inquirers</p> | <p>1-Defining energy, 2. Forms of energy 3. Energy Changes, 4. Waste of Energy - Wear and tear results in wasted energy, 5. Fuels- Candles/battery, 6. How energy use has increased, 7. Measuring Work, 8. Energy transfer , 9. Plants and energy, 10. Energy and Ourselves, 11. Generating Electricity, 12. Conservation of energy 13. Modes of heat transfer</p> <p>Connections: With language and Chemistry Service as Action – Charts showing conservation of energy Learning outcome- implications of their actions, working in collaboration.</p> |
|--|---------------|------------------------------------|---|---|--|---|--|

MYP 2- BIOLOGY

| MYP YEAR 2 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY) | | | | | | | |
|---|-------------|--------------------|---|--|--|---|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Healthy diet and digestion 20 sessions @ 40 min. | Systems | Function, Balance | Identities and relationship Exploration- Health and well being | The healthy functioning of a system maintains a balance and helps in growth of its related elements. | Objective A :Knowing and understanding | Thinking: Critical Transfer LP: Thinker, Balanced | 1- What are we made up of? 2- Structure and uses of carbohydrates, proteins and fats. 3- Uses of vitamins, minerals, fibre and water .4- Healthy diet and consequences of unhealthy diet. 5- Digestion in humans - both mechanical and chemical. Connections:- (Name of different foods and associated nutrients, their function in the body)Language acquisition Service as action :- Diet charts and food habits Learning outcome- Become more aware of own strengths and areas of growth |
| The circulatory and respiratory system 40 sessions @ 40 min. | Systems | Function, Balance | Identities and relationship Exploration- Lifestyle choices | The healthy functioning of a system maintains a balance and helps in growth of its related elements. | Objective B: Inquiring and designing Objective C: Processing and evaluating Objective D: Reflecting on the impacts of sciences | Communication Research: Information literacy LP:- Inquirer, Communicator Knowledgeable, Reflector | 1- Structure of heart and blood vessels 2- Movement of substances in and out of the circulatory system 3- Mechanism of circulation 4- Structure of respiratory system 5- Mechanism of respiration. 6- Exchange of materials in the system. 7- Care for both the systems. Connections:- (Data processing and graphs) Mathematics |
| Reproduction in humans 20 sessions @ 40 min. | Change | Balance | Personal and cultural expression Exploration- Social constructions of reality and ways of life. | Changes should be balanced to help the ways in which we express our culture, values and beliefs. | Objective A :Knowing and understanding | Affective: Mindfulness Perseverance: Emotional management LP:- Caring | 1- How the changes begin? 2- Behavioral changes 3- Hormones and adolescence. 4- Male and female reproductive organs- structure and importance. 5- The menstrual cycle and sexual intercourse 6- Fertilization and development of the baby. |

MYP 2- CHEMISTRY

MYP YEAR 2 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY)

| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
|--|---------------|------------------------|---|--|---|---|---|
| Periodic Table 30 sessions @ 40 min | Relationships | Patterns Function | Orientation in space and time. Area of exploration: Turning point and big history of development of periodic table | Patterns and relationships observed through a period of time, leading to discovery, creates history. | Objective A :Knowing and understanding Objective D: Reflecting on the impacts of science | Thinking Skills: Critical Learner Profile: Thinker | 1. History of periodic table and the arrangement of the elements in the periodic table. 2. Study of the physical and chemical properties of group 1, 17 and 18 and their applications in real life. 3. Scientific representation of symbols of elements, atomic number, atomic mass number. What are isotopes? 4. Formation of ions (cations and anions), concept of valency and writing the word equation. Service as Action - Activity based on each student selecting an element and representing the same with its properties and uses. Learning outcome- Develop international mindedness |
| Mixtures 30 sessions @ 40 min | Change | Energy Transfer | Orientation in space and time Area of exploration: Exchange and Interaction of energy during a change | . Interactions take place through transfer of energy resulting in change. | Objective B : Inquiring and Designing Objective C:Processing and Evaluating. | Thinking Skills: Critical Learner Profile: Thinker Inquirer | 1. Different kinds of mixtures 2-Solutions 3 Saturated solution. 3. Solubility. 4. Different methods of separation of mixtures. – Magnetic filtration (normal and using Buchner funnel) 5. Evaporation and crystallization. 6. Separating immiscible liquids using separating funnel. Lab work based on magnetic separation with sand and iron filings. |
| Chemistry in everyday life 20 sessions @ 40 min | Systems | Balance Form | Globalization and sustainability Area of exploration: Chemical processes cause impact on Environment. | Environment as a system creates a balance leading to global sustainability. | Objective D: Reflecting on the Impacts of Science | Research Skills: Information literacy Learner Profile: Knowledgeable | 1. Respiration, combustion, burning and reactions are fast if surface area is more- explosions caused by dust. 2.Oxygen and food. 3.Rusting is slow oxidation of iron in the presence of water/moisture. 4. High temperature and salt speeds up the process of rusting. 5.Methods to prevent rusting. 6. Aluminum and zinc are also oxidized. 7. Silver gets black coating due to oxidation. 8. Bronze gets green coating (patina) due to oxidation. 9. Copper gets green coating (verdigris) due to oxidation. |

MYP 2- PHYSICS

| MYP YEAR 2 INTEGRATED SCIENCES (DRAWN FROM PHYSICS) | | | | | | | |
|---|-------------|------------------------------|---|--|---|---|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Measuring Motion 30 sessions @ 40min | Change | Movement Consequences | Orientation in space and time Area of exploration- Displacement and exchange | The Consequences of Change are due to displacement and exchange between systems. | B: Inquiring and Designing C: Processing and evaluating | Communication Skills Organizational skills Learners Profile: Reflective Knowledgeable | 1. Speed,, 2. Speed records 3. Measuring speed, 4. Relationship between speed, distance and time, 5. Scalar and vector quantities, 6. Patterns of movement, 7. Distance/time graphs, 8. Velocity. Connections: With PE (Running) and Mathematics- graphs |
| Light and Sound 30 sessions @ 40 in. | Systems | Interaction | Scientific and technical innovation Area of exploration- modernization and engineering | Interaction between the systems has resulted in modernization leading to scientific ad technical innovation. | A: Knowledge and understandin g. D: Reflecting on the impacts of science | Communication Self- management: Research Skills: Literary skills | Light 1-Luminous and non-luminous objects. 2-Classification of non-luminous objects as transparent, translucent and opaque.3- Formation of a shadow 4- Reflection of light and its laws, 5- Real and virtual images, 6- Irregular reflection by rough surfaces, 7- Refraction of light, 8- Dispersion of light and rainbow, 9-Absorbing and reflecting colors, filtering colors, combining colors.10- Identifying Colors, 11. Structure of an eye Sound 1-Vibrations produce sound, 2- How sound travels. 3- Describing a sound wave(distance/displacement graph), 4- Structure of ear, 5- How is sound wave detected by the ear?, 6- Properties of sound waves, 7- Loudness of sound, 8- Pitch of sound, 9- Detecting sound Connections: With Biology- impact of loud sound on hearing. Service in action.-Hazards of loud sound- talk with grade 5 students Learning outcome- developing new skills, working in collaboration |

SCIENCES

| | | | | | | | |
|---------------------------------------|---------------|-----------------------|--|---|------------------------------------|--|---|
| Magnetism 20 sessions @ 40 min. | Relationships | Patterns Evidences | Scientific and technical innovation Area of exploration-modernization and engineering | Relationships between patterns lead to evidences which support scientific and technical innovation. | A: Knowledge and understanding. | Thinking skills Learners Profile: Knowledgeable Inquirers | 1-Iron,cobalt and nickel show strong magnetic properties 2- Behavior of magnets, 3- Inside a magnet, 4- The magnetic field, 5- The Earth's magnetic field, 6- Link between electricity and magnetism, 7-The electromagnets and their applications |
|---------------------------------------|---------------|-----------------------|--|---|------------------------------------|--|---|

MYP 3- BIOLOGY

| MYP YEAR 3 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY) | | | | | | | |
|--|-------------|-------------------------|---|--|---|--|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Ecosystems and human influence 20 sessions @ 40 min. | Change | Balance, Environment | Fairness and development Exploration- Rights and responsibilities for creating healthy environment. | Environmental Imbalance creates adverse changes affecting future generations. | Objective D: Reflecting on the impacts of science | Research: Information literacy Communication: LP:- Communicator, Risk-Taker, Inquirer | 1- Definitions of key terms 2- Structure of ecosystems. Relationships between living and non-living factors 3- Competition within an ecosystem 4- Different ecosystems and the factors that impact upon them. 5- Using up resources 6- Pollution• Conservation. Connection- Individual and Societies- Ecosystem Service as Action- Tree plantation Learning outcome- Persevere in action |
| Plants 30 sessions @ 40 min. | Systems | Interaction Environment | Globalization and Sustainability Exploration- Connection of Photosynthesis with transfer of energy | Interaction of systems with the environment plays vital role in transforming and conservation of energy for global sustainability. | Objective A: Knowing and understanding Objective B: Inquiring and designing Objective C: Processing and evaluating | Thinking: Critical Creative Transfer LP:- Thinker, Communicator | 1- Plant organ systems. 2- Plant reproduction 3- Structure of leaves and photosynthesis. 4- Factors affecting rate of photosynthesis 5- Testing plants for presence of starch, light and carbon dioxide. 6- Minerals needed for plant growth 7- Transformation of energy |
| Inheritance Plants- Reproduction and Photosynthesis and evolution 30 sessions @ 40 min. | Change | Consequences Balance | Scientific and technical innovation Exploration- Natural world and its laws, | Positive changes in nature is adapted only when there is a balanced approach of Scientific and technical innovation. | Objective A: Knowing and understanding Objective D: Reflecting on impacts of science | Self-management : Organization LP:- Principled | 1- DNA. 2- Chromosomes structures. 3- Mitosis and Meiosis 4- Advantages and disadvantages of mitosis and meiosis. 5- Genes 6- Alleles. Homozygous and Heterozygous pair of genes. 7- Variation |

| | | | | | | | |
|--|--|--|--|--|--|--|---|
| | | | Impact of scientific and technological advances on community and environments. | | | | 8- Darwin's theory of natural selection. 9- Evolution 10- Artificial selection. 11- Species. 12- Adaptations. 13- Charles Darwin theory of evolution by natural selection. |
|--|--|--|--|--|--|--|---|

MYP 3- CHEMISTRY

| MYP YEAR 3 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY) | | | | | | | |
|---|---------------|----------------------------|--|--|--|--|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Energy and chemical change 15 sessions @ 40 min | Change | Interaction Transformation | Scientific and Technical Innovation Area of exploration Scientific principles to understand Laws of conservation of energy. | Scientific principles and laws lead to changes and energy transformations. | Objective A :Knowing and understanding Objective B: Inquiring and designing Objective C: Processing and evaluating | Thinking Skills: Critical Communication skill Learner Profile: Thinker Communicator | 1. The law of conservation of mass. 2. Difference between physical and chemical change; reactant and product. 3. The types of reactions for eg. Exothermic and endothermic, along with the importance, uses and graphical representation. The concept of reversible and irreversible reaction. What is activation energy and the concept of catalyst? 4. Writing word and symbol equations. Importance of subscripts and coefficient in equations and its correlation with the valency and combination ratios. 5. What are salts? Formation of salts using metals, metal carbonates and neutralization reaction. FLASH CARD ACTIVITY |
| Periodic Table 15 sessions @ 40 min | Relationships | Patterns Models | Identities and relationships Area of exploration Identity of group 2 elements and their importance in our lives. | Pattern and relationships establishes the identity of an individual in a system. | Objective A Knowing and understanding | Thinking Skills: Critical Research Skills: Information literacy Learner Profile: Thinker Knowledgeable | 1. The study of group 2 and transition elements of the periodic table. 2-To study the use of transition elements as catalysts. |
| Patterns of reactivity | System | Interaction Pattern | Identities and relationships | Pattern and interaction establishes the | Objective A : Knowing and understanding. | Thinking Skills: Critical thinking | 1. Reaction of metals with oxygen, water and acids 2. Displacement reactions |

| | | | | | | | |
|--|---------|-------------------|---|---|--|---|---|
| 15 sessions @ 40 min | | | Area of exploration Reactivity Series of elements to justify the action of each element in a chemical reaction. | identity of an individual in a system and its relationship with others. | Objective B: Inquiring and designing | Learner Profile: Thinker Inquirer | 3. The reactivity series 4. The combustion of fuel and the products formed. |
| Rates of reaction 20 sessions @ 40 min | Change | Transfer Movement | Identities and relationships Area of exploration: Application of the knowledge of the factors affecting the rate of the reaction to real life. | The rate of any reaction system depends on the change that occurs due to the related transfer between the products and the reactants. | Objective B: Inquiring and designing Objective C: Processing and evaluating | Thinking Skills: Critical thinking Communication skill Learner Profile: Thinker Inquirer | 1. Measuring rates of reaction 2. Factors affecting rates of reaction 3. Catalysts 4. The particle theory and rates of reaction IDU with Math- Graphs |
| Separating Mixtures and water purification 15 sessions @ 40 min | Systems | Form Function | Orientation in time and space Area of exploration: The best method used to purify water. | The form and function of the systems orientated in time and space along with the form and function of separating mixtures | Objective A : Knowledge and understanding Objective B: Inquiring and designing Objective D- Reflecting on the impact of Science | Thinking Skills: Critical thinking Learner Profile: Thinker Inquirer | 1. Distillation (simple and fractional) 2. Chromatography of chlorophyll and pigment of flowers extracted using sox let extraction. 3. The concept of pure and impure, application to water purification. Connection with Arts- Primary and secondary colours |

MYP 3- PHYSICS

| MYP YEAR 3 INTEGRATED SCIENCES (DRAWN FROM PHYSICS) | | | | | | | |
|---|---------------|--------------------|--|---|---|---|---|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Density and Pressure 35 sessions @ 40 min. | Relationships | Models | Identities and relationships | The way in which objects exert pressure is a consequence of the interaction between the force and area in contact. | A: Knowing and Understanding C : Processing and Evaluating D: Reflecting on the impacts of science | Communication Skills Thinking skill: Critical Thinking Learner Profile - Thinker , Inquirer Communicator | 1.Introduction, 2.Comparing densities, 3.Measuring density of a regular solid, 4.Measuring density of an irregular solid, 5.Measuring density of a liquid 6.Floating and sinking, 7.Density of gases, 8.Pressure on a surface, 9.Reducing/Increasing the pressure, 10.Particles and pressure, 11.Pressure in liquids, 12.Pressure in gases, 13.Applications of pressure, 14.The turning effect of forces, 15.Types of levers, 16.Moments Connections: With chemistry- atoms and molecules |
| Electricity 45 sessions @ 40 min. | Systems | Form Function | Globalization and sustainability: Area of exploration - Human impact on the environment | Communities rely on systems that humans have developed through using components that have specific forms and functions. | A: Knowledge and understanding B: Inquiring and designing | Communication skills Thinking skills Learner Profile- Inquirer, Knowledgeable, Principled. | 1.Introduction, 2.The atom and electric charge, 3.Charging materials, 4.Insulators and conductors, 5.Induced charges, 6.Lightning, 7.Simple circuits 8.Resistance, 9.Other circuit components, 10.Current, 11. Voltage 12. Ohm's law; 13. Calculations using Ohm's law |

MYP 4- BIOLOGY

| MYP YEAR 4 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY) | | | | | | | |
|--|-------------|--------------------------------------|---|--|--|--|---|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Chemicals of life and animal nutrition. 10 sessions @ 40 min. | Systems | Function Balance | Identities and relationship Exploration- Health and well being | The healthy functioning of a system maintains a balance and helps in growth of its related elements. | A; Knowing and Understanding. | Thinking: Critical, Transfer LP: Thinker | 1- What are we made up of? 2- Structure and uses of carbohydrates, proteins and fats.3- Uses of vitamins, minerals, fibre and water.4- Healthy diet and consequences of unhealthy diet.5- Digestion in humans - both mechanical and chemical.6- Food production |
| Enzymes 8 sessions @ 40 min. | Change | Function Transformation | Scientific and technical innovation Exploration- Biological revolution | Scientific and technological advances enable societies to use, control and transform the function of organisms and biological molecules. | B: Inquiring and designing. C:Processing and evaluating | Collaboration Self-management: Reflection. LP: Reflector, Open- minded | 1- What is an enzyme and what enzymes do? 2- How and why enzymes are affected by temperature and pH?3- The uses of enzymes. 4- Culture of microorganisms. |
| Plant nutrition 12 sessions @ 40 min. | Systems | Interaction Environment Energy | Globalization and sustainability Exploration- Connection of Photosynthesis with transfer of energy | Interaction of systems with environment plays vital role in transforming and conservation of energy for global sustainability. | A: Knowing and understanding. B: Inquiring and designing C: Processing and evaluating. | Thinking: Critical ,Transfer LP: Thinker | 1- Types of nutrition.2- Photosynthesis.3- Structure of leaves. 4- Factors affecting rate of photosynthesis 5- Uses of glucose. 6- Limiting factors.7- Photosynthesis investigations. 8- Structure and functions of xylem and phloem. Connections: Mathematics - (Data analysis and graph plotting) |
| Living organisms in their environment. 10 sessions @ 40 min. | Systems | Interaction Environment Energy | Identities and Relationship Exploration- Competition and Cooperation between living | Organisms interact with the natural environment by transferring matter and energy | Objective D : Reflecting on the impacts of science | Research: Information literacy LP: Knowledgeable, Inquirer. | 1- Living organisms in their natural habitat. 2- Food chains and food webs. 3- How energy is passed from one organism to another through food chains and food web. 4- Energy losses can help improve the efficiency of producing food by agriculture. 5- How carbon, water and nitrogen are recycled in ecosystems.6- Factors |

| | | | | | | | |
|--|---------|---------------|---|--|---|--|--|
| | | | organisms and environment | . | | | that affect the size of population of organisms, including humans. |
| Cells and Cell movement 10 sessions @ 40 min. | Systems | Form Function | Fairness and Development Exploration- Functions of a cell and its contribution in functioning of life | Specific forms related to specialized functions of systems result into fairness and development. | Objective A : Knowing and understanding Objective B: Inquiring and designing. Objective C: Processing and evaluating. | Communication LP: Communicator | 1- Plant and animal cells - similarities and differences. 2- Cells contain different structures and organelles with specialized functions including: nucleus, cell membrane, cell wall, chloroplast, vacuole, mitochondria, and cytoplasm. 3- Cells may be specialized for specific functions (for example, leaf cell, root hair cell, sperm cell, red blood cell). 4- Cell must carry out all of the basic functions of life. The cell membrane regulates the flow of substances into and out of the cell. The surface area of the cell limits the amount of substances that can flow into and out of the cell. 5- The transport of substances into and out of cells during diffusion and osmosis is based on a concentration gradient. |
| Reproduction 30 sessions @ 40 min. | Change | Balance | Personal and cultural expression Exploration- Social constructions of reality and ways of life. | Changes should be balanced to help the ways in which we express our culture, values and beliefs. | Objective A : Knowing and understanding | Self-management: Affective Emotional Management LP: Balanced, Caring | 1- Life cycle involving sexual reproduction using the examples of a human and a flowering plant. 2-Life cycle involving both asexual and sexual reproduction for example, an aphid and coral. 3- Structure of an insect-pollinated flower. 4-Process of pollination, fertilization, seed and fruit formation and dispersal. 5- Label a diagram of the human male and female reproductive organs. 6- Role of hormones during puberty.7- Mechanism of fertilization, copulation, gestation and lactation. 8- Sexually transmitted diseases- Causes and prevention. |

MYP 4- CHEMISTRY

| MYP YEAR 4 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY) | | | | | | | |
|--|--------------|--------------------|--|--|--|---|---|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| The particulate nature of matter and Experimental techniques 20 sessions @ 40min. | Change | Transfer Pattern | Scientific and technical innovation Exploration – Processes for obtaining pure chemical products | Scientific and technical innovations have been observed as a result of the change of pattern in the transfers related to products and hence processes and solutions. | Objective B: Inquiring and designing Objective C Processing and evaluating | Thinking: Critical Creative Research: Information literacy L P- Thinker, Inquirer, Knowledgeable | 1- Properties of solids, liquids and gases. 2- Changes of state. 3- Atom, molecule and ion. 4- Diffusion 5- The particle theory. 6- Appropriate apparatus for the measurement. 7- Paper chromatography. 8- The importance of purity in substances for use in everyday life, e.g. in the manufacture of compounds to use in drugs and food additives Service as action: Testing the purity of water from swimming pool and waste water treatment plant Learning outcomes: Collaborative working and discussion and evaluation of the results. |
| Atoms, elements and compounds; The periodic table 15 sessions @ 40 min | Relationship | Change Pattern | Orientation in time and space Exploration - The exchange and interaction of electrons leads to the formation of compounds. | An exchange and interaction in the relationship leads to the change in the pattern oriented in space with time. | Objective A : Knowing and understanding | Thinking: Critical, Creative Research: Information literacy LP-- Thinker, Knowledgeable, Reflective | 1- Physical and chemical changes. 2- Elements, mixtures and compounds 3- Metals and non-metals 4- Solvent, solute, solution and concentration 5- Structure of an atom 6- Electronic structures 7- Proton number, 8- Nucleon number, 9 Isotopes |
| Stoichiometry 10 sessions @ 40 min | Systems | Balance Transfer | Orientation in time and space Exploration- Desired amount of product is due to interaction between the reactants. | A balanced system can be established by the transfer, exchange and interaction oriented in space with respect to time. | Objective A : Knowing and understanding | Thinking: Critical Transfer Self-management: Organization Learner Profile: Thinker, Knowledgeable, Reflective | 1- Chemical equations 2- Balancing a chemical equation 3- The mole concept 4- Calculating the limiting and excess reactants. |
| Electricity and Chemistry; Metals 15 sessions @ 40 min. | Systems | Movement Energy | Scientific and technical innovation Exploration - The electrolysis process of a solution is method | Movement of flow of energy in systems can be studied by carrying out an innovation in the scientific and | Objective B: Inquiring and designing Objective C: Processing and evaluating | Thinking: Critical, creative Social- Collaborative Learner Profile: Inquirer, Open-minded, | 1- Electrolysis 2- The terms electrode, electrolyte, anode and cathode. 3- The electrode products, using inert electrodes, in the electrolysis. 4- The products of electrolysis to the electrolyte and electrodes used 5- Refining of copper 6- Electroplating of metals 7- Extraction of aluminium by electrolysis method |

| | | | | | | | |
|--|--------|-------------------------|--|---|--|--|---|
| | | | to obtain pure product. | technical processes to obtain the solution for the desired products | Objective D : Reflecting on the impacts of science | Communicator, Reflective | 8- Reactivity series, Extraction of iron and zinc by reduction method 9- Uses of metals |
| Chemical energetics 10 sessions @ 40 min | Change | Energy Transfer | Scientific and technical innovation Exploration - The energetics of a system can be studied using models, diagrams and methods | Changes that occur in different systems due to the transfer of energy can be scientifically and technically explained using models and innovative methods. | Objective A : Knowing and understanding | Thinking: Critical Research: Information literacy Learner Profile: Thinker, Knowledgeable, Reflective | 1- Energetics of a reaction 2- Exothermic and endothermic changes related to change in temperature and energy |
| Chemical reactions 10 sessions @ 40 min. | Change | Conditions Consequences | Scientific and technical innovation Exploration - The amount of product depends on processes and solutions | A change in the scientific and technical innovations in the processes under various conditions and consequences leads to the desired solutions and products | Objective B: Inquiring and designing Objective C: Processing and evaluating | Thinking: Critical Creative Research: Information literacy Learner Profile: Inquirer, Open-minded, thinker | 1- Rate of reaction 2- Collision Theory 3- Factors influencing rate of reaction:- concentration, surface area or particle size, temperature and catalysts. • Redox reactions (oxidation and reduction) |

MYP 4- PHYSICS

| MYP YEAR 4 INTEGRATED SCIENCES (DRAWN FROM PHYSICS) | | | | | | | |
|---|---------------|---------------------------|--|--|---|--|---|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Motion 30 sessions @ 40 min. | Relationships | Movements Consequences | Scientific and technical innovation Exploration - Products, processes and solutions. | Relationship between movement and its consequences have resulted in scientific and technical innovation. | Objective B: Inquiring and Designing Objective C : Processing and Evaluating. | Thinking Skills Social Skills Learner Profile - Thinker , Inquirer Communicator | 1-Length and Time, 2-Speed, Graphs of speed-time and distance -time, 3-Mass and Weight, 4-Density, 5-Forces and their effects, Turning effects, 6-Centre of Mass, 7-Pressure, Work, energy and power, Energy resources. IDU - Physics + Physical and Health education Service as Action - "Investigating Speed." Learning Outcomes - developing new skills, working in collaboration. Connections With Math - Graphs |
| Thermal Physics 30 sessions @ 40 min. | Change | Energy, Transformation | Globalization and sustainability. Exploration - Human impact on the environment | Transformation of energy brings forth change resulting in Human Impact affecting globalization and sustainability. | Objective A : Knowledge and Understanding Objective D Reflecting on the impacts of science | Communication Skills Research Skills Learner Profile - Communicator , Reflective. | 1-Simple kinetic model of matter, 2-Pressure and volume changes for a gas, 3-Matter and thermal properties, 4-Measuring temperature, 5-Modes of heat transfer, 6-Consequences of Heat Transfer. Service as Action - Essay writing on "Implications of Global warming and the need to develop alternate sources of energy." Learning Outcomes - developing new skills, international-mindedness through global engagement. Connections with Language and Mathematics. |
| Waves 20 sessions @ 40 min. | Systems | Interaction, energy | Orientation in space and time. Exploration - Exchange and Interaction | Exchange of energy between systems result in the orientation of particles in space and time. | Objective B: Inquiring and Designing Objective C : Processing and Evaluating. | Thinking Skills Social Skills Learner Profile - Thinker , Inquirer Communicator | 1-General wave properties, 2- reflection, refraction, 3-Converging lens, 4-electromagnetic spectrum, 5-Sound, Service as Action - "Investigating Wave Phenomena". Learning Outcomes - becoming aware of strength and areas of growth, developing new skills, working in collaboration, persevere in action. Connections With Mathematics in numerical and Biology - impacts of sound waves. |

MYP 5- BIOLOGY

MYP YEAR 5 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY)

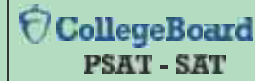
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
|---|---------------|--------------------------|--|--|--|---|---|
| Transport and Respiration in humans 20 sessions @ 40 min | Systems | Function Interaction | Identities and relationships Exploration- Life style Choices | The systems interact in coordination to support the common function for maintaining a person's health. | Objective B: Inquiring and designing Objective C: Processing and evaluating | Social: Collaboration Thinking: Critical LP: Open-minded, Thinker, Inquirer | 1- Structure and functioning of heart and blood vessels 2- Blood components 3- Transport of substances 4- Types of heart diseases 5- Structure and functioning of organs of respiratory systems 6- Breathing movements 7- Types of respiration 8- Exchange of gases. 9- Different types of respiratory diseases caused because of smoking Connections: (Data and graphs) Mathematics |
| Nervous system and hormones 20 sessions @ 40 min | Systems | Interaction Function | Identities and relationships Exploration- Physical, Psychological and social development; transitions | The systems interact in coordination to support the common function for maintaining a person's health. | Objective A : Knowing and understanding | Communication LP: Communicator | 1- The human nervous system- structure of neurons 2- Function of receptors and effectors 3- The endocrine system- glands and hormones secreted from these glands 4- Co-ordination and response in plants |
| Genetics 20 sessions @ 40 min | Relationships | Change Patterns | Orientation in space and time Exploration- Evolution, Constraints and adaptation | The evolution of genetic material is related to inherited traits and shows patterns. | Objective A : Knowing and understanding | Thinking: Critical LP: Thinker | 1- Chromosomes 2- Cell division 3- Inheritance of sex in humans 4- Monohybrid Inheritance 5- Variation and Selection |
| Human influence on the environment. 20 sessions @ 40 min | Relationships | Consequence Interactions | Globalization and sustainability Exploration- Human impact on the environment | The impact of decision making on humankind and the environment affects the relationship between them. | Objective D Reflecting on impacts of science. | Research: Information literacy LP: Inquirer, Knowledgeable | 1- Using up resources 2- Polluting the air and land 3- Pesticides in food chains 4- Pollution of rivers and seas 5- Deforestation 6- The greenhouse effect 7- Indicators of pollution 8- Conservation |

MYP 5- CHEMISTRY

| MYP YEAR 5 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY) | | | | | | | |
|---|---------------|----------------------------|---|--|--|--|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Acids, bases and salts 20 sessions @ 40 min. | Relationships | Evidence | Identities and relationships Exploration - Neutralization reaction is the result of the transition between the acid and base molecules. | Identities of individuals can be explored with respect to relationships that are evident with healthy transitions. | Objective B: Inquiring and designing Objective C: Processing and evaluating | Thinking: Critical Creative Research: Information literacy Learner Profile: Inquirer, Open-minded, thinker | 1- The characteristic properties of acids and bases 2- Types of oxides 3- Preparation of salts 4- Identification of ions and gases |
| Making of Chemical compounds: Sulphur and Carbonates 20 sessions @ 40 min. | Systems | Consequences Conditions | Globalization and sustainability Exploration - The commonly used acids and carbonates are interconnected by the use of different catalyst to increase the speed of reaction | Commonality and diversity in a system are interconnected depending upon the conditions and consequences that can sustain globally. | Objective A : Knowing and understanding | Thinking: Critical Learner Profile: Thinker, Knowledgeable and Reflective | 1- Uses of sulphur 2- Manufacture of sulphuric acid 3- Properties of sulphuric acid 4- Manufacture of lime from limestone 5- Uses of lime 6- Uses of limestone |
| Organic chemistry 25 sessions @ 40 min. | Systems | Interaction | Globalization and sustainability Exploration - The extensive consumption of non-renewable natural resources may lead to it | A system can globally sustain as a result of the interaction between consumption and conservation of natural resources | Objective A : Knowing and understanding | Thinking: Critical Learner Profile: Thinker, Knowledgeable and Reflective | 1- Names of compounds 2- Fuels 3- Homologous series 4- Structures of methane, ethane, ethene and ethanol. 5- Structures of the unbranched alkanes and alkenes. 6- Properties of alkanes, alkenes and alcohols. 7- Macromolecules. a. Synthetic polymers. b. Natural polymers |
| Air and water 15 sessions @ 40 min. | Systems | Transfer Balance | Globalization and sustainability Exploration - Pollutants that cause an impact on the environment | The human impact on the environment or the systems is due to transfer which does not sustain its balance globally | Objective D : Reflecting on the impacts of science | Thinking: Critical Social: Collaborative Learner Profile: Communicator, Open-minded, reflective | 1- Chemical test for water 2- Water treatment by filtration and chlorination 3- Composition of air , 4- Air pollutants 5- Formation of carbon dioxide 6- Manufacture of ammonia by Haber process 7- Rusting of iron 8- Fertilizers |

MYP 5- PHYSICS

| MYP YEAR 5 INTEGRATED SCIENCES (DRAWN FROM PHYSICS) | | | | | | | |
|---|---------------|--------------------------------|--|--|---|---|--|
| Unit title | Key concept | Related concept(s) | Global context | Statement of inquiry | MYP subject group objective(s) | ATL skills and Learner Profiles | Content (topics, knowledge, skills) |
| Electricity and Magnetism 25 sessions @ 40 min. | Change | Environment Consequences | Globalization and sustainability. Area of Exploration - Human impact on the environment | Increasing electrical energy production to meet the needs of an expanding global population can have environmental consequences. | Objective B: Inquiring and Designing Objective C : Processing and Evaluating. Objective D Reflecting on the impacts of science | Self-management : Research Information literacy Learner Profile- Inquirer, Knowledgeable, Principled, Reflective | 1-Phenomenon of Magnetism, 2-Electrical quantities like charge, current, potential difference ,e.m.f, resistance, 3-Circuit diagrams, series and parallel circuits, 4-Dangers of electricity. Service as Action - Writing a report on the field trip "Visit to the electrical cable plant". Activity on "Investigating Magnetism and Electricity". Learning Outcomes - developing new skills, working in collaboration, develop international mindedness through global engagement. Connections With Language, Mathematics and Business studies. |
| Electro-Magnetic Effects 25 sessions @ 40 min. | Change | Environment Consequences | Globalization and sustainability. Area of Exploration - Human impact on the environment | Increasing electrical energy production to meet the needs of an expanding global population can have environmental consequences. | Objective D Reflecting on the impacts of science | Self-management: Research Information literacy Learner Profile- Inquirer, Reflective, Principled. | 1-Magnetic effects of electric current, 2-Force on current carrying conductor, 3-d.c motor, 4-electromagnetic induction, 5-a.c.generator, 6-Transformers. Service as Action - Preparing and presenting a PowerPoint presentation on the topic "Do high voltage transmission lines cause health risks?" Learning Outcomes - developing new skills, working in collaboration, develop international mindedness. Connections With ICT, Language and Business studies. |
| Atomic Physics 30 sessions @ 40 min. | Relationships | Consequences, Energy, Evidence | Scientific and Technical innovation. Area of Exploration - Consequences and responsibility | Technological advances like nuclear energy affect the relationship between humans and the natural environment. | Objective A : Knowledge and Understanding | Communication Skills Thinking Skills Learner Profile - Communicator, Knowledgeable. | 1-The Nuclear Atom, 2-Radioactivity, radiations and their characteristics, 3- detection of radiations, 4- radioactive decay and half-life, 5- Safety Precautions while radioactive elements/ compounds in use and their disposal. Service as Action - Classroom Discussion on "Radiations, their characteristics and effects." Learning Outcomes - discuss and evaluate activities, developing new skills, develop international mindedness. Connections with Biology and Chemistry. |



Navrachana International School, Vadodara

Vasna-Bhayali Road, Vadodara - 391410 Gujarat, India.
Tel. : +91 - 265 - 2253851/2/3/4, Fax : +91 - 265 - 2253855,
E-mail : nis@navrachana.ac.in ; www.navrachana.edu.in

