

NISV

**Navrachana International
School, Vadodara**

Educating - Empowering - Enlightening

MYP SUBJECT GROUP OVERVIEW (SGO) INTEGRATED SCIENCES



MYP YEAR 1 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills	Content (Topic,Knowledge,Skills)
Properties of Matter and Materials 20 sessions @ 40 min.	Form	Transfer, Condition	Scientific and Technical Innovation Area of Exploration Models Systems	Models of System may change form depending on conditions	Criteria-A: Knowing and Understanding Criteria-B:Inquiring and Designing	Communication Skill Thinking Skill Learner Profile: Communicator, Knowledgeable	1.States of Matter 2.Interconversion of States of Matter 3.Particle model representation of different states of matter. 4.Determination of Melting Point and Boiling Point through graphical representation. 5.Properties of Materials in Everyday life 6.Metals and Nonmetals Properties 7.Testing properties of Metal for conduction of heat and electricity Connection with Mathematics-Graphical representation to determine melting point and boiling point Learning Outcome- Students will be able to understand the states of matter based on the particle model and also learn about properties of material and how based on property of material different substance have different uses.
Atomic Structure, Element and introduction to Periodic Table 20 sessions @ 40 min.	System	Interaction Model	Scientific and Technical Innovation Area of Exploration Model Methods	Models of the Systems may often establish the identities and develop methodical connections	Criteria-A: Knowing and Understanding	Thinking Skill Learner Profile: Critical Thinker	1.Early theories on Atom and Charged Particles. 2.Establishing the structure of Atom based on the position of charged particles. 3.Structure of Atom and arrangement of particles. 4.Bohr-Bury rule for arrangement of electrons. 5.Concept of Atomic number,Atomic Number,Isotopes,Valency 6.Writing the structure of the first 20 elements and writing its electronic configuration and identifying the valency of this element. 7.Metallic and Non metallic character based on the electronic configuration. 8. Concept of Element. 9. How to represent element with symbol for first twenty elements. 10.Understanding of different elements present in human body. 11.Introduction to periodic table. Connection with Biology- Students will learn about different elements present in the body system and helps balancing the functions. Learning Outcome: Students will learn to form the model of atom based on the electronic configuration and also how this arrangement determines the reactivity of the element

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<p>Acids and Alkalis 20 sessions @ 40 min.</p>	<p>Change</p>	<p>Interaction Consequence</p>	<p>Scientific and Technical Innovation Area of Exploration Processes and Solution Methods</p>	<p>Interaction between different systems helps in establishing the solutions and develop the processes.</p>	<p>Criteria-A: Knowing and Understanding Criteria-B: Inquiring and Designing Criteria-C: Processing and Evaluating</p>	<p>Communication Skill Thinking Skill Learner Profile Communicator Critical Thinker</p>	<ol style="list-style-type: none"> 1. Classification of substances as Acids and Bases based on general understanding. 2. Definition of Acid (Arrhenius Theory) 3. Difference between Mineral and Organic Acid 4. Classification as Strong and Weak Acid. 5. Arrhenius Definition of Base. 6. Indicators 7. Classification-Natural and Synthetic Indicator 8. Universal Indicator and pH Scale 9. Neutralization Reaction 10. Understanding of Neutralization on the basis of dissociation theory. 11. Titration process for neutralization using indicator and using a pH meter to determine the end point of neutralization 12. Application of Neutralization Reaction <p>Learning Outcome-Students will learn to classify substance as acid and base by testing or knowing their colour change with indicators</p>
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MYP YEAR 1 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic, Knowledge, Skills)
<p>Cells and Microorganisms</p> <p>40 sessions @ 40 min</p>	Systems	Consequence Interaction	<p>Scientific and technical innovation</p> <p>Exploration: Consequences and responsibility. Methods Process Solutions</p>	<p>The interactions between systems have consequences that often leads to new solutions.</p>	<p>Objective D: Reflecting on the impacts of science</p>	<p>ATL Skills: Research Skills</p> <p>LP: Knowledgeable</p>	<p>Cells:</p> <ol style="list-style-type: none"> 1- The use of a microscope. 2- The cell theory. 3- Basic parts of cells- different parts and their functions. 4- Types of cells- Prokaryotic and Eukaryotic 5- Plant cell and animal cells-their differences. 6- Adaptations in cell- different types of specialized cells. 7- Cells, tissues, organs, organ systems (e.g.: skeletal and muscle system introduction along with the basic information about other organ systems) and organisms. <p>Microorganisms:</p> <ol style="list-style-type: none"> 1- The microbial kingdom- Role of various scientists, definition of the terms like “disease”, “infectious” “communicable”, “micro-organism” and “pathogen” 2- Identification of fungi, bacteria, protists and viruses as pathogenic microorganisms. 3- Reproduction in fungi, bacteria and viruses. 4- Main biological and structural differences between fungi, bacteria, protists and viruses. 5- Defense mechanism of our immune system restricted to phagocytosis and immune response. 6- Infectious diseases and the problems they cause with specific reference to: fungal diseases (for example, athlete’s foot, ringworm) bacterial diseases, viral diseases. 7- Communicable and non-communicable diseases, how communicable diseases spread, care taken to prevent them from spreading. 8- Role of medicines like antibiotics and antifungal. 9- The useful microorganisms and their role. 10- Methods of preventing food from spoilage. 11- Role of vaccines. <p>Connection- Art (ratio of individual parts in drawing diagrams) Connection- Language and Literature (Essay on cell analogy with real life system)</p> <p>Service as Action- Activity on Health and Hygiene.</p> <p>Learning Outcomes-</p> <p>Become more aware of own strengths and areas of growth. Develop international-mindedness through global engagement, multilingualism and intercultural understanding.</p> <p>Working collaboratively with others.</p>

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<p>Living Organisms Characteristics, Classification and Variation</p> <p>40 sessions @ 40 min</p>	<p>Systems</p>	<p>Form, Evidence</p>	<p>Scientific and technical innovation Exploration-Principles and discoveries.</p>	<p>Every structured system is often classified based on its form and the evidences, with a scope of further development.</p>	<p>Objective A: Knowing and understanding</p>	<p>ATL Skills: Thinking Skills- Critical Thinking</p> <p>LP: Thinkers</p>	<p>1- Living things (organisms) share the common qualities of movement, reproduction, sensitivity, growth, respiration, elimination and nutrition. 2-How is the classification system made and developed? 3-Classification systems are practical tools for scientists to communicate with one another. 4-Classification is the grouping and naming of organisms based on their shared characteristics. 5- Division of organisms into five kingdoms. 6- The animal kingdom and basic sub-divisions. 7-The plant kingdom and basic sub-divisions. 8- Organisms that can reproduce with one another and produce fertile offspring are members of the same species. 9- 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) 10-Using and constructing dichotomous keys to classify a group of organisms or objects. 11- Introduction to variation-Variation occurs in DNA and this leads to different traits. Variation may be continuous where traits fall into discrete categories (for example, blood groups).Variation may be discontinuous where there is a range of traits from one extreme to another. Connection- Mathematics- Organizing data and data handling techniques in variation topic.</p>
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MYP YEAR 1 INTEGRATED SCIENCES (DRAWN FROM PHYSICS)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills	Content (Topic,Knowledge,Skills)
<p>Forces and Friction 15 sessions @ 40 min.</p>	<p>Change</p>	<p>Energy Interaction</p>	<p>Scientific and Technical Innovation Area of Exploration System Processes Solutions</p>	<p>Energy changes in any System is often due to interactions.</p>	<p>Criteria-A: Knowing and Understanding Criteria-B:Inquiring and Designing Criteria-C: Processing and Evaluating</p>	<p>Communication Skill Thinking Skill</p> <p>Learner Profile: Communicator Thinker</p>	<p>1.Understanding Forces 2.Classification of Force-Contact and Non Contact Force 3.Types of Force 4.How to determine magnitude of force? 5.Difference between mass and weight 6.Understanding the concept of gravity 7.Concept of Friction and types of Friction 8.Fluid Friction 9.Balanced and Unbalanced Forces 10.Free fall and Factors affecting air resistance 11.Numericals for calculating mass and weight.</p> <p>Connection with Mathematics-</p>

							Graphs, Numericals Learning Outcomes: Students will understand different effect of forces based on its magnitude and also understand about the frictional forces that is necessary and at the same time also having a damaging effect.
Physics and Measurement 15 sessions @ 40 min.	System	Patterns Models	Scientific and Technical Innovation Area of Exploration Models Methods	Differential perspectives may often develop different patterns and models within system	Criteria-A: Knowing and Understanding	Thinking Skill Learner Profile: Thinker	1. Understanding of Measurement and units 2. SI system of units and its importance 3. Learning how to measure the different physical quantities like- Length, Area, Volume, Mass, Time and Temperature. 4. Measurement of Area and Volume for Regular and Irregular objects. 5. Concept of Estimation, Accuracy and Precision 6. What are measurement errors? 7. Measurement Errors- Random Component and Systematic Component. 8. How to remove parallax error in measurement? Connection with Mathematics- Using graph for area calculation Learning Outcome: The perspective of measurement will be developed along with the understanding of determining the errors in measurements.
Energy 15 sessions @ 40 min.	Change	Interaction Transformation	Globalization and Sustainability Area of Exploration Conservation Consumption	Interaction between systems leads to change/transformations.	Criteria-A: Knowing and Understanding Criteria-D- Reflecting on impacts of Science	Thinking Skill Research Skill Learner Profile Thinker Knowledgeable	1. Defining energy 2. Forms of energy 3. Mechanical Energy Numerical 4. Renewable and Non-renewable Sources of Energy 5. Pros and Cons of renewable and non renewable resource of energy 6. Energy Transformation 7. Wasted Energy- Sankey Diagram 8. Law of Conservation of Energy 9. How electricity is generated? 10. Concept of Work and its classification as positive, negative and zero work. 11. Numericals on work done. Connection with Mathematics for numericals and Individuals and Societies to understand more of conventional energy source Learning Outcome: The concept of energy transformation and how to define the concept of work scientifically will be discussed..

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Electricity and Circuits 15 sessions @ 40 min.	Change	Transformation Energy	Scientific and Technical Innovation Areas of Exploration: System Processes and Solution	The transformational changes in the system is due to energy processes	Criteria- A:Knowing and Understanding	Thinking Skills Learner Profile Creative Thinker	<ol style="list-style-type: none"> 1. What is electricity and how is it produced? 2. Understanding electric current. 3. Working of torch and electric bulb, understanding more on cell 4. symbols used for circuit and understanding parallel and series circuit 5. Heating effect of electric current. 6. Concept of Magnets. 7. Magnetic effect of electric current. Learning Outcomes: Students will learn the basic concept of circuit and electric current as well as its effect on magnetic field
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MYP YEAR 2 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Body Systems-1 60 sessions @ 40 min.	Systems	Balance, Interaction	Identities and relationships Exploration- Lifestyle choices for Health and Well-Being	Balanced interactions between the systems often leads to good- health and well-being.	Objective B: Inquiring and designing Objective C: Processing and evaluating	ATL Skills: Research Skills- Information Literacy LP:- Balanced	Structures and functions of different body systems- restricted to human digestive, circulatory and respiratory systems Digestive System: <ol style="list-style-type: none"> 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 an unhealthy diet. 5- Parts of the digestive system and their functions. 6- Digestion in humans - both mechanical and chemical. 7-Structure of a tooth and dental care. Circulatory and Respiratory System: <ol style="list-style-type: none"> 1- Structure of heart and blood vessels along with functions. 2- Mechanism of double circulation. 3- Blood Components. 4- Movement of substances in and out of the circulatory system. 5- Structure of the respiratory system and the functions of its parts. 6- Mechanism of respiration. 7- Exchange of gases in the system. 8-The interconnectedness between the

							<p>two systems. 9- Diseases and problems associated with both the systems and the care required.</p> <p>Interaction between these systems- Health and Well-Being based on life-style choices.</p> <p>Connections:- (Data processing and graphs) Mathematics 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 your own strengths and areas of growth. Develop international-mindedness through global engagement, multilingualism and intercultural understanding. Working collaboratively with others. Undertake challenges that develop new skills.</p>
<p>Ecology</p> <p>20 sessions @40 min</p>	Change	Environment, Consequences	<p>Globalization and sustainability Exploration: The impact of decision-making on humankind and the environment.</p>	<p>Changes in the environment now are often the consequence of human impacts.</p>	<p>Objective D: Reflecting on the impacts of science</p>	<p>ATL Skills: Communication LP: Communicators</p>	<p>1- Definitions of key terms such as habitat, population, community, ecosystem, biosphere, etc. 2- Biological community and physical environmental factors of an ecosystem- biotic and abiotic factors 3-Sampling organisms in a habitat and presenting the results 4- Food Chains, food webs and energy flow - Interdependence and interaction between populations. 5-Competition within an ecosystem-limited resources, predator-prey interactions 6- Human Influence on the environment-The effects of natural events and human activities on ecosystems and our responsibility in managing these effects. Connection- Digital Design- Use of technology to make presentations/videos related to the changes in the environment due to human activities.</p>

MYP YEAR 2 INTEGRATED SCIENCES (DRAWN FROM PHYSICS)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Measuring Motion 15 sessions @ 40 min.	Change	Movement Consequences	Orientation in Space and Time Areas of Exploration Duration Displacement and exchange	Displacement is the consequence of Movement and may also depend on the duration.	Criteria-A: Knowing and Understanding Criteria-B: Inquiring and Designing Criteria-C: Processing and Evaluating	Communication Skills Thinking Skill Learners Profile: Communicator Knowledgeable	1. Understanding Motion, Distance and Displacement. 2. Frame of Reference for motion. 3. Types of Motion 4. Measuring speed, 5. Relationship between speed, distance and time. 6. Scalar and vector quantities. 7. Conversions of km/hr-m/s. 8. Plotting of Distance-Time graphs 9. Interpretation of Distance-Time graphs 10. Acceleration, Types of Acceleration-Uniform, Non-Uniform, Positive and Negative. 11. Introduction to Equation of Motion 12. Numericals to calculate Speed, Acceleration. Connections: With PE (Running) and Mathematics- graphical representation and interpretation of motion graphically. Learning Outcome: Student will be able to describe different types of motion and also learn to calculate speed and estimate time based on data of speed and distance for journey.

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<p>Magnets and Magnetic Materials 15 sessions @ 40 min.</p>	<p>System</p>	<p>Interaction Transformation</p>	<p>Scientific and Technical Innovation Areas of Exploration Systems Principles and Discoveries</p>	<p>Transformation is the effect of connection and interaction within the system</p>	<p>Criteria-A: Knowing and Understanding</p>	<p>Thinking skills Learners Profile: Knowledgeable</p>	<ol style="list-style-type: none"> 1.What are magnets? 2.Properties of Magnets-Temporary and Permanent Magnets. 3.Properties of Magnets 4.Concept of magnetic field 5.Demonstration of Magnetic field 6.Direction of Magnetic field 7.Magnetic Material and domain 8.Magnetizing Material-Stroking Method and Electromagnetism. 9.Electromagnets and Factors affecting strength of Electromagnet. 10.Application of Electromagnet 11.Working of Electric bell,Relay and Maglev trains. <p>Learning Outcome: Students will understand the concept of Magnetic field, and learning of magnetic domain they will understand the role of atomic structure in understanding the property of magnet.</p>
<p>Light 10 sessions @ 40 min.</p>	<p>Change</p>	<p>Transformation Interaction</p>	<p>Scientific and Technical innovation Areas of Exploration Systems Processes and Solutions</p>	<p>Transformation may develop pattern within the system leading to varied perspective</p>	<p>Criteria-A: Knowing and Understanding Criteria-B:Inquiring and Designing Criteria-C: Processing and Evaluating</p>	<p>Thinking skills Learners Profile: Thinker Knowledgeable</p>	<ol style="list-style-type: none"> 1.Luminous and non-luminous objects. 2. How do non-luminous objects become visible? 3.Rectilinear Propagation of Light 4.Experimental verification of Rectilinear propagation of light. 5.Reflection of light-Diffused and Regular. 6.Laws of Reflection of Light 7.Formation of Shadow. 8.Refraction of Light. 9.Dispersion of Light 10.Dispersion through Prism-pectrum. 11. Newtons Experiment on light-Prism and Disc experiment. 12.Rainbow-Understanding the concept through dispersion. 13.Human Eye and its parts 14.Power of Accommodation. 15Type of .Defects in the Human eye. 16.Color addition and Color subtraction <p>Connection with Biology-Understanding the structure of Eye and its parts Connection with Mathematics-Understanding how to measure angle and concept of angles lying in a plane.</p>

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							Learning Outcome-Students will learn about the scientific terms associated with light and also understand various phenomenon observed in nature as well as the daily life which can be very well explained based on the conceptual understanding of light.
Our Universe 10 sessions @ 40 min.	System	Balance Movement Function	Orientation in Space and time Areas of Exploration: Displacement and Exchange Frequency and Variability	Balance within a system has functional relationship with movement	Criteria-D: Reflecting Impacts of Sciences	Research Skill: Information Literacy Learner Profile: Knowledgeable	<ol style="list-style-type: none"> 1.The moon and its phases. 2.The stars. 3.Constellations. 4.The Solar System. 5.Asteriods. 6. Comets,Meteoroids,Meteorites 7.Travel in Space-Man on the moon. 8.Law of gravitation and moon's gravitation. 9.Ocurrence of tides,Wind,Storm and Cyclone. 10.Barometer <p>Learning Outcomes- Students will be able to understand more about the planet Earth and also various phenomenon observed</p>
Sound 10 sessions @ 40 min.	Form	Interaction Pattern	Orientation in Space and Time Areas of Exploration Frequency and Variability Exchange and Interaction	Exchange and interaction in the system may often create a form of variable frequency	Criteria-A: Knowing and Understanding Criteria-D- Reflecting the impact of Science	Thinking Skills Research Skills Learner Profile: Thinker Knowledgeable	<ol style="list-style-type: none"> 1 Describing a sound 2.How is sound produced?. 3.Propogation of Sound Waves 4.Sound waves are longitudinal waves. 5.Sound needs a medium to travel. 6.Wave form of Sound and its characteristics. 7. Understanding-Amplitude,frequency and Time period. 8.Claculating Speed of Sound. 9.Refelction of Sound 10.Echo and Multiple Reflections 11.Oscilloscope 12.Noise and causes of Noise Pollution 13.Harmful effects and how to reduce noise pollution. <p>Connection with Mathematics-Solving numericals to determine the speed of Sound Service as action.-Hazards of loud sound-poster making</p> <p>Learning outcome- Students will understand the concept of sound with technical terms and learn to calculate he speed of sound and also develop more insight in te the concept of reflection sound.</p>

MYP YEAR 2 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic, Knowledge, Skills)
Periodic Classification of Elements 20 sessions @ 40 min.	System	Function Pattern	Scientific and Technical innovation Areas of Exploration: Methods Processes and Solutions	Functional relationship within the system develops solution	Objective A :Knowing and understanding	Thinking Skills Research Skill Learner Profile: Thinker, knowledgeable	<ol style="list-style-type: none"> 1. Early attempts of classification of elements. 2. Dobereniens Law of Triads and its drawbacks. 3. Newlands Law of Octaves and its drawbacks 4. Mendeleeffs Classification and periodic law with its advantage and drawback. 5. Modern Periodic Table. 6. How Modern Periodic Table explains the anomaly in Mendeleev periodic Table. 7. Understanding the trend in the properties of elements in the periodic table for Atomic Size, Atomic radii, Metallic Character, Electropositive and Electronegative nature. <p>Learning outcome- Student will develop understanding of different element existing in nature and how they were systematically arranged and classified. The methods used to develop different method for the classification of elements in certain patterns.</p>
Chemical Reactions 20 sessions @ 40 min.	Balance	Interaction Model	Scientific and Technical innovation Areas of Exploration: Methods Processes and Solutions	Balance created by interaction can be explained with model	Objective A :Knowing and understanding	Thinking Skills Learner Profile: Thinker	<ol style="list-style-type: none"> 1. What are Chemical Symbols? 2. Earlier attempts to represent the element with symbols and modern method. 3. Atomicity and Radicals 4. Writing formula for compounds 5. Writing formula for compound with radicals 6. Writing Chemical equation. 7. Classification of changes as Physical and Chemical Change. 8. Differences in Physical and Chemical Changes 9. Understanding Chemical Change by representation of chemical equations with particle model for the components. 10. Law of Conservation of Mass. 11. Verification of Law of Conservation of Mass. 12. Corrosion 13. Rusting and chemical equation of the rusting 14. Balancing of Chemical equations <p>Learning Outcome: Students will understand how to represent element with symbol and representation of the formulas of compound, balancing of chemical equations.</p>

<p>Elements, Compounds and Mixtures</p> <p>20 sessions @ 40 min.</p>	<p>Change</p>	<p>Interaction Condition</p>	<p>Identities and Relationships Areas of Exploration Identity formation Transitions</p>	<p>Different identities can be established based on the interaction and changes observed during transition</p>	<p>Objective A :Knowing and understanding</p>	<p>Thinking Skill Communication Skill Social Skill Learners Profile: Thinker, Communicator, Knowledgeable</p>	<ol style="list-style-type: none"> 1. Classification of Chemical Substances. 2. Understanding of Element, Compound and Mixture with particle representation 3. Types of Mixtures 4. Separation techniques for different types of mixtures. 5. Concept of Paper Chromatography and its application. 6. Types of Solutions. 7. Understanding Colloids, Suspension and True Solutions. 7. Factors affecting the solubility. 8. Understanding the solubility curve. 9. Factors affecting solubility of gas. 10. Concept of diffusion and factors affecting the rates of diffusion. <p>Learning Outcome: Students will learn different separation techniques and also practically observe it by doing separation of component of ink .They will learn the concept of solubility and different factors that affect the solubility</p>
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MYP YEAR 3 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Body Systems-2 30 sessions @ 40 min.	Systems	Balance, Function	Personal and cultural expression Exploration- The ways in which we reflect on lifestyle choices for Health and Well-Being	Balanced functioning between system often leads to good health and well-being.	Objective A :Knowing and understanding	ATL Skills: Social Skills- Collaboration LP:- Open-Minded	Structures and functions of different body systems- restricted to human skeletal muscle, nervous, urinary and reproductive systems Nervous System: Outline the role of the nervous system, including sense organs, neurons and the central nervous system (spinal cord and the brain). Urinary system: Outline the role of the kidney and liver in excretion. Skeletal Muscle System: Describe the relationship between muscle and bone to explain movement using a hinge joint such as the elbow or the knee. Reproductive System: 1- How do the changes begin? 2- Behavioural changes-hormones and adolescence 3- Reproduction – definition and types with examples 4-Male and female reproductive systems- function of organs 5- The menstrual cycle. 6- Fertilization and development of the baby. 7- Effect of diet, drugs and diseases on growth and development. Coordination between these systems- Health and Well-Being based on life-style choices.

<p>Plants- Photosynthesis and Reproduction 30 sessions @ 40 min.</p>	<p>Systems</p>	<p>Transformation, Energy</p>	<p>Globalization and sustainability: Exploration: Consumption and conservation</p>	<p>Transformation of energy between systems can be advantageous to the mankind.</p>	<p>Objective B: Inquiring and designing Objective C: Processing and evaluating</p>	<p>ATL Skills: Thinking Skills- Critical and Creative LP:- Inquirers</p>	<p>Introduction:Plant organ systems. Photosynthesis: 1-Use of words to describe how photosynthesis involves the conversion of light energy into chemical energy 2-State that chlorophyll is the main photosynthetic pigment. 3- Structure of leaves-external and internal- as an organ of photosynthesis 4- Stating factors affecting the rate of photosynthesis 5 –Experiments- Testing plants for presence of starch, investigating the importance of light, chlorophyll and carbon dioxide for photosynthesis. 6- Stating the role of xylem and phloem- the transport system of plants 7- Minerals needed for plant growth- Any two. 8- Transformation of energy- Explain the role of photosynthesis in the ecosystem and its importance to the world’s human population.</p> <p>Reproduction in flowering plants- Introduction on sexual and asexual reproduction - definition,differences, advantages and disadvantages. 1- Describe the structure of a typical hermaphrodite flower and function of its parts. 2-Difference between an insect-pollinated flower and a wind pollinated flower.Characteristics of flowers based on the agents of pollination. 3-Pollination- definition, types and importance. 4- Describe the process of pollination, fertilization, seed and fruit formation. 5- Fruit and seed dispersal- advantages and types of dispersal based on the type of seeds/fruits.</p>
<p>Genetics- Inheritance and Variation 20 sessions @ 40 min.</p>	<p>Change</p>	<p>Transformation Function</p>	<p>Scientific and technical innovation Exploration- Impact of scientific and technological advances on community and environments.</p>	<p>Functional transformation due to scientific and technological advances can lead to a permanent change.</p>	<p>Objective D: Reflecting on the impacts of science</p>	<p>ATL Skills: Communication Skills: Communication LP:- Communicators</p>	<p>1- DNA-Genetic information is contained in DNA. 2- Chromosomes and DNA structures. 3- Cell – Division-Mitosis with stages and Meiosis only information. 4-Traits are characteristics that are passed from parent to offspring. 5-Genes- Genes are sections of DNA that give instructions specifying the traits of an organism. 6-Alleles- Homozygous pairs have two identical alleles of a gene. Heterozygous pairs have two different alleles of a gene.</p>

							<p>7- Variation- Variation occurs in DNA and this leads to different traits, can be influenced by the environment too. Variation may be continuous where traits fall into discrete categories (for example, blood groups). Variation may be discontinuous where there is a range of traits from one extreme to another.</p> <p>8-Punnett Charts- The genotypes and phenotypes of offspring can be determined using a Punnett square. Construct and use the monohybrid cross to make predictions on genotypes and phenotypes.</p> <p>9-Natural selection theory in brief.</p> <p>10-Manipulating genes for human usage- Selective Breeding.</p>
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MYP YEAR 3 INTEGRATED SCIENCES (DRAWN FROM PHYSICS)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Density and Pressure 25 sessions @ 40 min.	Change	Consequence System	Scientific and Technical innovation Areas of Exploration: Methods Products	Change in the form of system is the consequences of method adopted	Criteria-A: Knowing and Understanding Criteria-B: Inquiring and Designing Criteria-C: Processing and Evaluating	Communication Skills Learners Profile: Communicator Knowledgeable	1.Understanding the term density 2.Calculating density 3. Calculating density for the irregular object by volume displacement method 3.Density as intrinsic property 4.Measuring density of liquids 5.How temperature affects density 6. Concept of Up thrust and buoyancy 7.Factors on which up thrust depends 8.Introduction to the Pressure 9. Calculation of the Pressure with formula 10. Factors which affect the pressure 11.Pressure in gases and liquids 12.Atmospheric Pressure 13.How Pressure varies with Altitude In atmosphere 14.How pressure varies with depth in liquids 15.How hydraulic works? 16.Pascal Law and its application 17.Application of Pressure 18.Numericals on the concept Learning Outcome- Student will have understanding of density and how to determine the same. They will also understand the effect of pressure at altitude as well as depth
Electrostatics and Electric Current 25 sessions @ 40 min.	System	Interaction Balance	Scientific and Technical Innovation Areas of Exploration: Methods Processes	Balance in the system is due to continuous interaction and transformation in the processes.	Criteria-A: Knowing and Understanding Criteria-B: Inquiring and Designing Criteria-C:	Communication Skills Learners Profile: Communicator, Thinker Knowledgeable	1.Introduction to Electricity and its need 2.Concept of atom and electric charge 3.What are charged particles 4.Insulators and conductors, 5.Charging of objects by friction,conduction or Induction 6. Determining charge with Gold leaf

					Processing and Evaluating		electroscopes 7. Lightning-How it occurs and how the damage can be controlled 8. Concept of Current, Voltage and Resistance 9. Simple Circuit and symbols used to represent a circuit diagram 10. Ohms Law, 11. Factors affecting resistance 12. Specific resistance 13. Series and Parallel Circuit 14. Calculating the equivalent resistance for series and parallel circuits 15. Heating effect of electric current 16. Calculation of Power 17. Estimating power consumption and energy Learning Outcome: Students will learn the difference between static and current electricity and also how we can arrange the circuits to increase or decrease the resistance
Energy 15 sessions @ 40 min.	Change	Environment Transformation	Globalization and Sustainability Area of Exploration: Consumption Conservation	Methodical change may lead to transformation of the conservation process	Objective A: Knowing and Understanding Objective D: Reflecting Impacts of Science	Thinking Skills: Research Skills Learner Profile: Thinker Knowledgeable	1. Introduction to Energy 2. Understanding Kinetic and Potential Energy 3. Derivation of expression for Kinetic and Potential Energy based on equations of motions 4. Derivation to understand the conservation of Energy 5. Renewable and Non renewable resources 6. Details of all different types of resources with advantages and disadvantages. 7. Understanding the concept of Heat transfer with particle model-Conduction, Convection and Radiation. 8. Numericals on Calculation of Energy under different situations. Service as Action: Creating Flyers to explain How to Save Energy Learning Outcome- Students will learn about different form of energy and also sources of energy.

MYP YEAR 3 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic, Knowledge, Skills)
The Periodic table and development of Atomic Model 20 sessions @ 40 min.	Development	Patterns Forms	Scientific and Technical Innovation Area of exploration Models, System	Forms and patterns helps in developing and establishing models of the system	Objective A Knowing and understanding	Thinking Skills, Research Skills Learner Profile: Thinker, Knowledgeable	1. Development of Atomic Structure with different Models 2. Thomson Model 3. Rutherford's Nuclear Model and its drawbacks 4. Bohr's Model of Atom and its Shortcoming. 5. Quantum Model based on dual nature of

							<p>particle and Schrödinger's Theory</p> <p>6.Properties of Group-7 and Group-18 elements.</p> <p>7.Properties of Group-1 and Group-2 elements.</p> <p>8.Trends observed in the property down the group for Group-1,Group-2,Group-7 and Group-18 elements.</p> <p>Learning Outcome: Students will develop the understanding of the development of the model of atom and also learn about trends in the properties in certain groups</p>
<p>Preparation of Salts and types of Chemical Reactions</p> <p>25 sessions @ 40 min.</p>	Change	Energy Transformation	<p>Scientific and Technical innovation Areas of Exploration Processes and Solutions Methods</p>	<p>Methods of transformation depends on the energy and process adopted.</p>	<p>Objective A Knowing and understanding</p>	<p>Thinking Skills Learner Profile: Thinker</p>	<ol style="list-style-type: none"> 1. What are salts? 2. Formation of salts by reactions of metals, metal oxide, metal carbonates and Base with acids. 3.Stagewise details of process involved in preparation of salts. 4.Preparation of Soluble and Insoluble salts. 4.Naming of Salts. 5.Purification process of Salt. 6.Classification of Reactions 7.Synthesis Reaction 8.Deomposition Reaction 9.Single displacement Reaction. 10.Double Displacement Reaction 11.Combustion Reaction 12.Complete and Incomplete Combustion Reaction products. 13.Redox reaction-Introduction 14. Reactivity Series. 15.Understanding the reactivity of element based on reactivity series.and importance of the reactivity series <p>Learning Outcome: Students will learn about different ways in which salts are prepared and also about different types of reaction and how we can determine the reactivity of the certain element.</p>
<p>Energy transfers in the Chemical Reactions and rates of Chemical Reactions</p> <p>15sessions @ 40 min.</p>	Change	Interaction Transformation	<p>Scientific and Technical Innovation Areas of Exploration: Methods Processes and Solution</p>	<p>Interaction taking place within the system may lead to transformation in surroundings</p>	<p>Objective A: Knowing and Understanding</p> <p>Objective B: Inquiring and designing</p> <p>Objective C: Processing and evaluating</p>	<p>Thinking Skills Communication skill:</p> <p>Learner Profile: Knolwedgeable,C ommunicator</p>	<ol style="list-style-type: none"> 1.Classification of reactions and processes as Exothermic and Endothermic process 2.Concept of Enthalpy to understand the heat of the system. 3.Examples of Exothermic and Endothermic Reactions. 4. Measuring the heat transfer in the chemical reactions with Calorimeter. 5.Concept of Bond energy and how energy transfers affect bond energy. 6. Measuring rates of reaction 7. Factors affecting rates of reaction 8. Catalysts

							<p>9..Energy Profile Diagram for reactions. 10.Collision theory to explain reactions. Learning Outcome: Students will learn about how chemical reactions takes place and what are the energy changes involved in the chemical reactions.This unit will help student understand the factors on which the chemical reaction depends</p>
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MYP YEAR 4 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
<p>Cells and Cell movements</p> <p>13 sessions @ 40 min.</p>	Relationships	Form, Function	<p>Scientific and technical innovation</p> <p>Exploration-Processes</p>	Structural forms are often functionally related to processes.	<p>Objective B: Inquiring and designing.</p> <p>Objective C: Processing and evaluating.</p>	<p>ATL Skills: Communication Skills LP: Communicators</p>	<p>1-State that living organisms are made of cells. 2-Describe and compare the structure of a plant cell with an animal cell, as seen under a light microscope, limited to cell wall, nucleus, cytoplasm, chloroplasts, vacuoles and location of the cell membrane. 3- Explain the functions of the structures seen under the light microscope in the plant cell and in the animal cell 4- Cells may be specialized for specific functions (for example, leaf cell, root hair cell, sperm cell, red blood cell). 5- Calculate magnification and size of biological specimens using millimeters as units. 6-The transport of substances into and out of cells- The concept of diffusion and osmosis along with various examples in living organisms. 7-Investigate the factors that influence diffusion and osmosis, limited to surface area, temperature, concentration gradients and diffusion distance.</p>

SGO-INTEGRATED SCIENCES

<p>Biological molecules and animal nutrition. 20 sessions @ 40 min.</p>	<p>Relationships</p>	<p>Function, Balance</p>	<p>Identities and relationships Exploration- Health and well being</p>	<p>Functional relationships often help in maintaining a balance for good health and well-being.</p>	<p>Objective A: Knowing and understanding.</p>	<p>ATL Skills: Thinking Skills: Critical and Transfer LP: Thinkers</p>	<p>1- What are we made up of? 2- Macromolecules: monomers and polymers Structure, sources and uses of carbohydrates, proteins and fats. 3- Uses and sources of vitamins, minerals, fibre and water. Deficiency diseases. 4. Food sample tests 5- Healthy/Balanced diet- age, gender and activity affect the dietary needs of humans including during pregnancy and while breast-feeding and consequences of an unhealthy diet. 6- Describe the effects of malnutrition in relation to starvation, constipation, coronary heart disease, obesity and scurvy 7- Digestion in humans – The structure of the digestive system and the functions of the organs involved. 8- Structure of a villus and its importance. 9- Explanation of mechanical and chemical digestion 10- Enzymes-Definition, role and investigating the factors affecting enzyme action. 11-Human Teeth- Types, structure and function, causes of dental decay and dental care.</p>
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<p>Plants- Nutrition and Transport</p> <p>22 sessions @ 40 min.</p>	<p>Systems</p>	<p>Environment Energy</p>	<p>Globalization and sustainability Exploration- Connection of Photosynthesis with transfer of energy</p>	<p>Efficient energy transfers between environmental systems can lead to global sustainability.</p>	<p>Objective A: Knowing and understanding.</p>	<p>ATL Skills: Thinking Skills: Critical and Transfer</p> <p>LP: Thinkers</p>	<p>1- Types of nutrition. 2- Photosynthesis- definition, along with equations 3- Role of chlorophyll. 4- Outline the subsequent use and storage of the carbohydrates made in photosynthesis 5- Investigate the necessity for chlorophyll, light and carbon dioxide for photosynthesis, using appropriate controls. 6- Investigate and describe the effect of varying light intensity and temperature on the rate of photosynthesis (e.g. in submerged aquatic plants) 7- Structure of leaves- Identify and describe the significance of various layers of the internal leaf. 8- Limiting factors of photosynthesis. 9- The structure, adaptation and function of the root hair cell and the concept of osmosis for water absorption. 10 – Vascular Bundles- basic structure of xylem and phloem, their arrangements in sections of roots, stems and leaves in non-woody dicotyledonous plants. 11- Transpiration- transpiration stream, factors affecting the rate. 12- Transport of water and sugars in plants. 13- Explain the uses and effect of nitrate ion and magnesium ion deficiency on plant growth 14- Role of plants in the ecosystem and a need for conservation. Connections: Mathematics - (Data analysis and graph plotting)</p>
<p>Transport and Respiration in humans</p> <p>25 sessions @ 40 min</p>	<p>Systems</p>	<p>Function, Balance</p>	<p>Identities and relationships Exploration- Life-style choices for good health and well-being!</p>	<p>Good health and well-being is often due to the balanced functioning of systems.</p>	<p>Objective D: Reflecting on the impacts of science</p>	<p>ATL Skills: Social Skills- Collaboration</p> <p>LP: Open- minded</p>	<p>1-Describe the circulatory system as a system of blood vessels with a pump and valves to ensure one-way flow of blood. 2- Name and identify the structures of the human heart. 3- Describe double circulation in terms of circulation to the lungs and circulation to the body tissues in mammals and its advantages. 4- Describe the functioning of the heart in terms of the contraction of muscles of the atria and ventricles and the action of the valves. 5- Name the main blood vessels to and from the heart. 6 - Investigate and explain the effect of physical activity on pulse rate 7- Explain how the structures of arteries, veins and capillaries are adapted for their</p>

							<p>function</p> <p>8- List and explain the functions of blood components.</p> <p>9- Name and identify the structures of the human respiratory system. Explain the role of each organ.</p> <p>10- Explain the features of an efficient respiratory/gas exchange surface.</p> <p>11- State and explain the differences in composition between inspired and expired air. Use of lime water as a test for carbon dioxide.</p> <p>12- Investigate and explain the effects of physical activity on rate and depth of breathing.</p> <p>13- Explain the role of goblet cells, mucus and ciliated cells in the respiratory system.</p> <p>14- Different types of circulatory and respiratory diseases caused due to life-style choices.</p> <p>15- Difference between breathing and respiration.</p> <p>16- Uses of energy in the body. The word and balanced chemical equation of aerobic respiration</p> <p>17- Anaerobic respiration definition and examples.</p> <p>18- Aerobic vs anaerobic respiration.</p>
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MYP YEAR 4 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
<p>The particulate nature of matter and Experimental techniques</p> <p>20 sessions @ 40min.</p>	Change	Conditions	<p>Scientific and technical innovation</p> <p>Exploration – Systems, methods, processes</p>	<p>The study of changing conditions within a system often need appropriate methods and processes.</p>	<p>Objective A: Knowing and understanding</p> <p>Objective B: Inquiring and designing</p> <p>Objective C: Processing and evaluating</p>	<p>ATL</p> <p>-Thinking Skills</p> <p>-Research skills</p> <p>Learner Profile</p> <p>-Thinker,</p> <p>-Inquirer,</p> <p>-Knowledgeable</p>	<p>1- Properties of solids, liquids and gases.</p> <p>2-Changes of state.</p> <p>3- Atom, molecule and ion.</p> <p>4- Diffusion</p> <p>5- The particle theory.</p> <p>6- Appropriate apparatus for the measurement.</p> <p>7- Paper chromatography.</p> <p>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.</p> <p>Service as action: Using different non- verbal modes of communication to spread awareness on purity of substances in everyday life.</p> <p>Learning outcomes: Collaborative working and discussion and evaluation of the results.</p> <p>Connections: With Language Acquisition - Non- verbal communication on spreading awareness of purity.</p>

SGO-INTEGRATED SCIENCES

<p>Atoms, elements and compounds; The periodic table</p> <p>15 sessions @ 40 min</p>	<p>Systems</p>	<p>Change Pattern</p>	<p>Orientation in time and space Exploration - Frequency and variability</p>	<p>Frequency and variability can bring a change in the patterns formed within systems.</p>	<p>Objective A: Knowing and understanding</p>	<p>ATL - Thinking skills, Research skills</p> <p>Learner Profile -Thinker, -Knowledgeable</p>	<p>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</p> <p>Learning Outcomes: Students will be able to understand the periodic table. They will be able to explore the type of bonding in chemical compounds and also identify the bonding in different compounds.</p>
<p>Stoichiometry</p> <p>10 sessions @ 40 min</p>	<p>Relationship</p>	<p>Balance</p>	<p>Scientific and technical innovation Exploration- product, systems</p>	<p>In a system a balanced relationship often leads to obtain the desired product.</p>	<p>Objective A: Knowing and understanding</p>	<p>ATL - Thinking Skills Self- management skill</p> <p>Learner Profile: -Thinker -Knowledgeable -Reflective</p>	<p>1- Chemical equations 2- Balancing a chemical equation 3- The mole concept 4- Calculating the limiting and excess reactants.</p> <p>Learning Outcomes: Students will be able to construct chemical equations and balance them to determine the mole ratio. They will also be able to describe and explain the mole concept and also identify the limiting and the excess reactant in a reaction.</p>
<p>Electricity and Chemistry; Metals</p> <p>17 sessions @ 40 min.</p>	<p>Systems</p>	<p>Movement Energy</p>	<p>Scientific and technical innovation Exploration - products, processes</p>	<p>Flow of energy in a process determines the product in a system.</p>	<p>Objective B: Inquiring and designing</p> <p>Objective C: Processing and evaluating</p> <p>Objective D: Reflecting on the impacts of science</p>	<p>ATL - Thinking skills Social skills</p> <p>Learner Profile: - Inquirer, -Communicator, -Risk-taker</p>	<p>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 8- Reactivity series, 9- Extraction of iron and zinc by reduction method 10- Uses of metals</p> <p>Learning Outcomes: Students will be able to explore the process of electrolysis. They will be able to describe, explain, analyze and predict the products of the process. They will also learn the use of reactivity series in the extraction of metals.</p>

SGO-INTEGRATED SCIENCES

Energy changes in chemical reactions 08 sessions @ 40 min	Change	Energy Transfer	Scientific and technical innovation Exploration - Systems, processes	Energy changes in a system often helps to identify the process.	Objective A: Knowing and understanding	ATL- Thinking skills Research skills Learner Profile: -Thinker, -Knowledgeable	1- Energetics of a reaction 2- Exothermic and endothermic changes related to change in temperature and energy Learning Outcomes: Students will be able to identify the type of the energy change in a chemical reaction.
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MYP YEAR 4 INTEGRATED SCIENCES (DRAWN FROM PHYSICS)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Motion 20 sessions @ 40 min	Relationships	Development Environment	Globalization and sustainability Exploration (consumption conservation, natural resources and public goods)	Technological developments /innovations often alter the relationships people have with their local and global environments.	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 & power, Energy resources. Service as Action - "Investigating Speed." Service as Action – Investigating Descent time of Parachute. Service as Action – Safety involved in the use of Maruti Van as a school van Learning Outcomes- developing new skills, working in collaboration. Connections With Math - Graphs
Thermal Physics 20 sessions @ 40 min.	Change	Energy Transformation	Globalization and sustainability Exploration - Human impact on the environment	Human Impacts on the environment are often due to energy transformations.	Objective A : Knowledge and Understanding [FA] Processing and Evaluating [FA]	Communication Skills Research Skills Learner Profile Communicator,	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.

SGO-INTEGRATED SCIENCES

<p>Waves</p> <p>20 sessions @ 40 min.</p>	<p>Change</p>	<p>Consequences</p> <p>Energy</p>	<p>Personal and cultural expression</p> <p>Exploration - (entrepreneurship, practice and competency)</p>	<p>Technological gadgets lead to consequences that often transform matter and energy that satisfy human needs and desires.</p>	<p>Objective B: Inquiring and Designing [FA]</p> <p>Objective C: Processing and Evaluating.</p> <p>Objective D: Reflecting on the impacts of science [SA]</p>	<p>Self-Management Skills</p> <p>Social Skills</p> <p>Learner Profile</p> <p>- Balanced, Caring, Open-Minded.</p>	<p>1-General wave properties, 2- Reflection, Refraction[Wave Phenomena]</p> <p>3-Converging lens, 4-Electromagnetic spectrum, 5-Sound,</p> <p>Investigations - "Investigating Wave Phenomena" through reflection in a plane mirror".</p> <p>"Investigating Wave Phenomena" through refraction through a glass slab/Prism".</p> <p>Service as Action - Impacts of Electromagnetic waves - The Wavy Issue.</p> <p>Learning Outcomes- becoming aware of strength and areas of growth, developing new skills, working in collaboration, persevere in action.</p> <p>Connections With Mathematics in numerical and Biology in the impacts of radiations.</p>
<p>Motion</p> <p>20 sessions @ 40 min.</p>	<p>Systems</p>	<p>Interaction</p> <p>Movement</p>	<p>Scientific and technical innovation</p> <p>Exploration: models</p>	<p>Changes in energy of an object are only accomplished by working on the systems</p>	<p>Objective B: Inquiring and designing. Objective C: Processing and evaluating.</p>	<p>ATL -Thinking Skills</p> <p>Self-management</p> <p>III. Organization skills</p> <p>Managing time and tasks effectively.</p> <p>Learner profile: thinking</p>	<p>1-Length and Time, 2-Speed, velocity and Acceleration-Graphs of speed-time and distance -time,</p> <p>3-Mass and Weight, 4-Density,</p> <p>5-Forces and their effects, 6-Pressure, Work, energy & power, Energy resources.</p> <p>Learning Outcomes- Students are able to distinguish between scalar and vector quantities. They are able to read graphs of speed-time and distance- time and are able to develop skills to calculate physical quantities using formulas.</p> <p>Connections: Math - Graphs, formulas (changing the subject)</p>

MYP YEAR 5 INTEGRATED SCIENCES (DRAWN FROM BIOLOGY)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Coordination and response 20 sessions @ 40 min	Systems	Interaction, Function	Identities and relationships Exploration- Physical and psychological development	Functional interaction of systems often leads to effective development.	Objective A : Knowing and understanding	ATL Skills: Communication Skills LP: Communicators	1- The human nervous system- introduction, structure and function of different types of neurons. 2- Function of receptors and effectors. 3- The simple reflex arc. 4- The sense organs- structure and functions of the parts of an eye and skin. 5- The concept of pupil reflex and accommodation. 6- Homeostasis and negative feedback - Temperature and sugar regulation in the body. 7- The endocrine system- glands and hormones secreted from these glands 8- Co-ordination and response in plants- Geotropism and phototropism. Role of auxin. 9- Difference between nervous system and endocrine system
Inheritance 20 sessions @ 40 min	Relationships	Patterns	Orientation in space and time Exploration- Evolution and adaptation.	Changes in adaptation is often related with evolutionary patterns.	Objective A : Knowing and understanding	ATL Skills: Thinking Skills: Critical LP: Thinkers	1- Chromosomes, genes and DNA. 2-Various genetics terminologies. 3- Cell division types and their differences. 4- Inheritance of sex in humans- Punnett Chart. 5- Monohybrid Inheritance- Punnett Charts. 6- Pedigree analysis. 7- Variation- Continuous and discontinuous examples. Mutations 8 – Selection- Natural selection, theories of evolution, adaptations and artificial selection along with examples. 9- Difference between natural selection and artificial selection.

<p>Reproduction</p> <p>20 sessions @40 min.</p>	<p>Change</p>	<p>Patterns</p>	<p>Scientific and technical innovation Exploration-processes and solutions</p>	<p>Changing the pattern of a process can lead to a solution.</p>	<p>Objective B: Inquiring and designing.</p> <p>Objective C: Processing and evaluating.</p>	<p>ATL Skills: Research Skills- Information Literacy</p> <p>LP: Knowledgeable</p>	<ol style="list-style-type: none"> 1- Reproduction- Definition and types with examples. 2-Life cycle involving sexual reproduction using the examples of a human and a flowering plant. 3- Advantages and disadvantages of both kinds of reproduction. 4- Structure of an insect-pollinated flower and the function of each part. 5- Types of flowers based on the agents of pollination- comparison. 6-Process of pollination, fertilization, seed and fruit formation and dispersal. 7-Seed Germination and requirements. 8- Label a diagram of the human male and female reproductive organs. Function of the labeled parts. 9- The male and female gamete- structure and comparison. 10- Role of hormones during puberty. 11- The menstrual cycle. 12- Mechanism of fertilization, copulation, gestation and lactation. 13- Sexually transmitted diseases- Causes and prevention. 14- Advancements in the field of medical technology.
<p>Ecosystems and Human impact on the environment.</p> <p>20 sessions @ 40 min</p>	<p>Relationships</p>	<p>Balance, Environment</p>	<p>Fairness and development. Exploration- Ecology and impact</p>	<p>Ecological balance is often related with the environmental impacts.</p>	<p>Objective D : Reflecting on the impacts of science.</p>	<p>ATL Skills- Research Skills- Information literacy</p> <p>LP: Caring</p>	<ol style="list-style-type: none"> 1- Living organisms in their natural habitat- key terms 2- Food chains and food webs. 3- How energy is passed from one organism to another through food chains and food web. 4- Constructing food chains. Identifying the trophic level of the organisms from food chains and food webs. 5- How carbon, water and nitrogen are recycled in ecosystems. 6- Factors that affect the size of population of organisms, including humans. 7- Using up resources and the carbon cycle. 8- Polluting the air, land and water. 9- Pesticides and chemicals in food chains. 10- Deforestation and its impact. 11- The greenhouse effect. 12- Indicators of pollution 13- Conservation

MYP YEAR 5 INTEGRATED SCIENCES (DRAWN FROM CHEMISTRY)

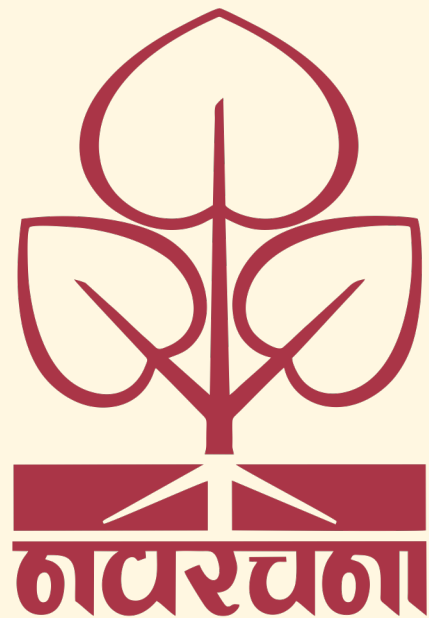
Unit Title	Key Concept	Related Concepts	Global Context	Statement of inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Chemical Reactions 10 sessions @ 40 min	Change	Conditions Consequences	Scientific and technical innovation Exploration - Systems; processes	Change of conditions within a system often leads to consequences in the processes.	Objective B: Inquiring and designing Objective C: Processing and evaluating	ATL - Thinking skills Research skills 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. 4- Redox reactions (oxidation and reduction) Learning Outcomes: Students will be able to explore the concept of rate of reaction. They will be able to describe, explain and analyze the factors affecting the rate of reaction experimentally.
Acids, bases and salts 20 sessions @ 40 min.	Change	Evidence	Scientific and technical innovation Exploration - systems, methods	An evidence of change in the systems properties causes a change in method as well.	Objective A: Knowing and understanding Objective B: Inquiring and designing Objective C: Processing and evaluating	ATL - Thinking skills Research skills Learner Profile: -Inquirer, -Thinker	1- The characteristic properties of acids and bases 2- Types of oxides 3- Preparation of salts 4- Identification of ions and gases Learning outcomes: Students will develop critical and creative thinking and research skills, They will also learn evaluating the data collected and analyzing the results.
Sulphur and Carbonates 20 sessions @ 40 min.	Systems	Consequences Conditions	Scientific and technical innovation Exploration - products, processes	The consequences of manufacturing process in a system affect the yield of the product	Objective A : Knowing and understanding	ATL - Thinking skills Learner Profile: -Thinker, -Knowledgeable	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 Learning Outcomes: Students will explore the scientific procedures involved in industrial manufacturing and its effects.

SGO-INTEGRATED SCIENCES

<p>Organic chemistry</p> <p>25 sessions @ 40 min.</p>	<p>Systems</p>	<p>Balance</p>	<p>Globalization and sustainability Exploration – Consumption conservation</p>	<p>A balance between consumption and conservation is necessary for a healthy system.</p>	<p>Objective D : Reflecting on the impacts of science</p>	<p>ATL - Research skills</p> <p>Learner Profile: -Reflective, -Knowledgeable</p>	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> a. Synthetic polymers. b. Natural polymers <p>Learning Outcomes: Students will explore the branch of organic chemistry. They will be able to identify alkane and alkene by chemical test. They will be able to define, describe, and explain the role of polymers in everyday life.</p>
<p>Air and water</p> <p>15 sessions @ 40 min.</p>	<p>Systems</p>	<p>Balance Environment</p>	<p>Globalization and sustainability Exploration- Human impact on the environment</p>	<p>Extensive use of resources often disturbs the environmental system.</p>	<p>Objective D : Reflecting on the impacts of science</p>	<p>ATL - Thinking skills Research skills</p> <p>Learner Profile: -Communicator, -Open-minded</p>	<ol style="list-style-type: none"> 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 <p>Learning Outcomes: Students will learn about the water treatment method and also explore the various pollutants in the environment. They will be able to explain and describe the carbon cycle and its effect on global warming.</p>

MYP YEAR 5 INTEGRATED SCIENCES (DRAWN FROM PHYSICS)

Unit Title	Key Concept	Related Concepts	Global Context	Statement of Inquiry	MYP Subject Group Objectives	ATL Skills and Learner Profiles	Content (Topic,Knowledge,Skills)
Electricity and Magnetism 25 sessions @ 40 min.	Change	Environment Consequences	Globalization and sustainability. Area of Exploration - Human impact on the environment	Consequences of exploring sustainable energy production can have an environmental impact.	Objective B: Inquiring and Designing Objective C: Processing and Evaluating.	Self-management: Research Information literacy Learner Profile- Inquirer, Critical Thinking Knowledgeable	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. Investigation on "Investigating Magnetism and Electricity". [simulation] Investigating Ohm's Law [Simulation/ Practical in the Lab] Learning Outcomes - developing new skills, working in collaboration. Connections With Language, Mathematics and Business studies to develop International Mindedness.
Electromagnetic Effects 25 sessions @ 40 min.	Change	Environment Consequences	Globalization and sustainability. Area of Exploration - Human impact on the environment	Exploring Sustainable energy production often changes the human impacts on the Environment.	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 to develop International Mindedness.
Atomic Physics 30 sessions @ 40 min.	Relationships	Development Environment	Globalization and Sustainability Area of Exploration (consumption, conservation, natural resources and public goods)	Technological Developments often alter the relationships people have with their local and global environments.	Objective A : Knowledge and Understanding Objective D : Reflecting on the impacts of science.	Communication Skills Thinking Skills Research 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. IDU : Business Studies and Economics 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 Business Studies, Economics, Biology and Chemistry



The Navrachana logo comprises three leaves of the Bodhi tree under which Lord Buddha attained enlightenment. The leaves signify the three vital facets of the child's physical, mental-emotional growth, and development. This translates as Navrachana, which is "New Creation".

The emblem thus symbolizes the aim of the school, which is to build, nurture, and groom these three qualities, to create well-balanced and multifaceted individuals who consistently strive to realize their true potential