



Centre for Teacher Accreditation

# **Syllabus for Middle School Science**

## Middle School Science (VI - VIII)

### Biology

**Body Movements** - Gait Of Animals, Movement Of Earthworm, Snail, Cockroach, Birds, Fish, Snakes, Human Body Movements: Human Body And Its Movements, Joints, Ball And Socket Joints, Pivotal, Joint, Hinge Joints, Fixed Joints, Skeleton, X-Ray, The Rib Cage, Backbone, Shoulder Bones, Pelvic Bones, Skull, Cartilage, Muscle

**Plant Anatomy** - Herbs, Shrubs And Trees, Stem, Leaf, Part Of A Leaf, Leaf Venation, Transpiration, Root, Flower, Observations On Flowers, Parts Of The Open Flower

**Animal Organ Systems** - Digestive System: Digestion, Different Ways Of Taking Food, Various Modes Of Feeding, Starfish; Circulatory System: Blood, Cells Of Various Kinds, Blood Vessels, Types Of Blood Vessels, Capillaries, Heart, Atria, Ventricles, Heartbeat, Respiratory System: Breathing In Other Animals, Cockroach, Tracheae, Earthworm; Breathing Underwater; Excretory System: Excretion In Animals, Reproductive System: Modes Of Reproduction, Sexual Reproduction, Male Reproductive Organs, Sperms, Female Reproductive Organs, Ova (Eggs), Fertilization, Zygote, Internal Fertilization, In Vitro Fertilization, External Fertilization, Development Of Embryo, Foetus, Viviparous And Oviparous Animals, Metamorphosis

**Human Excretory System** - Excretory System In Humans an introduction, Kidneys, Bladder, Ureters, Urethra, Sweat, Dialysis

**Digestion In Humans** - Alimentary Canal (Digestive Tract), Glands Such As Salivary, Glands, The Liver And The Pancreas, Digestive System, The Mouth And Buccal Cavity, Ingestion, Type Of Teeth, Saliva, Breaks Down The Starch Into Sugars, Tongue, Taste Buds, Tooth Decay, The Food Pipe/Oesophagus, Movement Of The Walls Of The Food Pipe, The Stomach, Hydrochloric Acid And Digestive Juices, The Small Intestine, Liver, Pancreas, Pancreatic Juice, Absorption In The Small Intestine, Villi, Assimilation, Large Intestine

**Human Respiratory System** - Breathing in Humans, Lungs, Nasal Cavity, Diaphragm, Expiration

**Human Endocrine System** - Hormones Other Than Sex Hormones, Thyroid Gland, Thyroxine, Insulin, Adrenalin, Growth Hormone, Role of Hormones

**Human Reproductive System** - Reproductive Health, Nutritional Needs Of The Adolescents, Adolescence And Puberty, Changes At Puberty, Development Of Sex Organs, Reaching Mental, Secondary Sexual Characters, Hormones, Endocrine Glands, Male Hormone Or Testosterone, Female Hormone Or Estrogen, Mammary Glands, Pituitary Gland, Role Of Hormones In Initiating Reproductive Function, Target Site, Reproductive Phase Of Life In

Humans, Menstruation, Menarche, Menopause, Sex Determination Of The Baby, Sex Chromosomes

**Plant Nutrition System** - Mode Of Nutrition In Plants, Autotrophs, Heterotrophs, Photosynthesis — Food Making Process In Plants, Stomata, Chlorophyll, Carbohydrates, Synthesis Of Plant Food Other Than Carbohydrates, Nitrogen Fixation in Plants, Other Modes Of Nutrition In Plants, Heterotrophic Plants, Host And Parasite, Insectivorous Plants, Saprotrophs, Symbiotic Relationship, Nutrient Cycles that replenish Soil, Rhizobium, Nutrients From The Soil, Fertilisers

**Plant Reproductive System** - Modes Of Reproduction, Vegetative Parts, Reproductive Parts, Asexual, Reproduction, Vegetative Propagation, Budding, Fragmentation, Spore Formation, Sexual Reproduction, Stamens, Pistil, Unisexual Flowers, Bisexual Flowers, Male Gametes, Female Gamete, Pollination, Fertilisation, Fruits And Seed Formation, Seed Dispersal, Plant Respiration, Role of roots in respiration

**Plant Transportation System** - Transport Of Substances In Plants, Transport Of Water And Minerals, Vascular Tissue, Xylem, Phloem, Transpiration

**Plant Life Processes:** Growth, Respiration, Different Mechanisms For The Exchange Of Gases, Excretion, Reproduction, Sexual and Asexual Reproduction in plants, Budding, Binary Fission

**Nutrition** - Food Variety (Ingredients), Food Materials And Sources, Plant Parts And Animal Products As Food, Animal Diet, Herbivores, Carnivores, Omnivores, Nutrients and Digestion, Tests For Presence Of Carbohydrates, Proteins And Fats, What Do Various Nutrients Do For Our Body, Balanced Diet, Deficiency Diseases, Digestion In Grass-Eating Animals, Rumen, Rumination, Cellulose, Feeding And Digestion In Amoeba, Pseudopodia, Food Vacuole

**Respiration** - Purpose of Respiration, Cellular Respiration, Aerobic Respiration, Anaerobic Respiration, Breathing, Inhalation, Exhalation

**Crop Production and Management** - Agricultural Practices, Kharif Crops, Basic Practices Of Crop Production, Agricultural Practices, Preparation Of Soil, Loosening Of Soil, Tilling Or Ploughing, Plough, Agricultural Implements, Plough, Hoe And Cultivator Sowing, Selection Of Seeds, Traditional Tool, Seed Drill, Adding Manure And Fertilisers, Manure And Fertilisers, Examples Of Fertilisers, Organic Manure, Crop Rotation, Advantages Of Manure, Irrigation, Sources Of Irrigation, Traditional Methods Of Irrigation, Modern Methods Of Irrigation, Sprinkler System, Drip System, Protection From Weeds, Weeding, Weedicides, Harvesting, Threshing, Combined Harvester, Winnowing, Storage, Silos And Granaries, Food From Animals, Animal Husbandry

**Microorganisms** - Microorganisms, Bacteria, Fungi, Protozoa And Algae, Viruses, Where Do Microorganisms Live, Friendly Microorganisms, Making Of Curd (Yogurt) And Bread, Commercial Use Of Microorganisms, Fermentation, Medicinal Use Of Microorganisms, Antibiotics, Vaccine, Antibodies, Increasing Soil Fertility, Harmful Microorganisms, Pathogens, Disease Causing Microorganisms In Humans, Communicable Disease Carriers,

Disease Causing Microorganisms In Animals, Disease Causing Microorganisms In Plants, Food Poisoning, Nitrogen Fixation, Nitrogen Cycle

**Food preservation** - Food Preservation, Chemical Method, Preservatives, Preservation By Common Salt, Preservation By Sugar, Preservation By Oil And Vinegar, Heat And Cold Treatments, Pasteurization, Storage And Packing

**Habitat** - Habitat And Adaptation, Animals and Plants Found In Different Surroundings, Adaptation, Habitat, Types Of Habitats, Acclimatisation, Biotic And Abiotic Components, Germination, Terrestrial Habitats, Deserts, Mountain Regions, Grasslands, Prey and Predator, Aquatic Habitats, Oceans, Ponds And Lakes

**Conservation of Plants and Animals** - Deforestation And Its Causes Consequences Of Deforestation, Droughts, Desertification, Conservation Of Forest And Wildlife, Biosphere Reserve, Flora And Fauna, Endemic Species, Species, Wildlife Sanctuary, Project Tiger, Endangered Animals, Ecosystem, National Park, Migration, Recycling Of Paper, Reforestation

**Characteristics and Functions of Cell Organelles** - Discovery Of The Cell, Organisms Show Variety In Cell Number, Shape And Size, Number Of Cells, Shape Of Cells, Pseudopodia, Size Of Cells, Cell Structure And Function, Tissues, Parts Of The Cell, Cell Membrane, Nucleus, Cytoplasm, Cell Wall, Organelles, Nucleolus, Chromosomes, Genes, Prokaryotic Cells, Eukaryotic Cells, Vacuole, Plastids, Comparison of Plant and Animal Cells

## Chemistry

**Thermochemistry** - Hot And Cold, Sense Of Touch, Temperature, Thermometer- Clinical and Laboratory, Measuring Temperature, Heat Flows, Conduction, Conductors, Insulators, Convection, Sea Breeze, Land Breeze, Radiation

**Physical and Chemical Changes** - Reversible and Irreversible changes, Physical Changes, Chemical Reaction, Burning as a Chemical Change, Rusting, Galvanisation, Crystallisation

**Combustion** - Fuel, Forest Fire, Ignition Temperature, Inflammable Substances, Controlling Fire, Fire Extinguisher, Types Of Combustion, Rapid Combustion, Spontaneous Combustion, Explosion, Flame, Structure Of A Flame, Different Zones Of Candle Flame, Fuel, Ideal Fuel, Fuel Efficiency, Calorific Value

**Acids, Bases and Salts** - Natural Indicators, Litmus: A Natural Dye, Turmeric as Natural Indicator, China Rose As Indicator, Phenolphthalein, Neutralization reaction, Indigestion in humans, Treatment of Ant Sting, Soil Treatment, Factory Wastes

**Metals and Non Metals** - Physical Properties Of Metals And Non-Metals, Malleability, Electrical Conductivity Of Materials, Ductility, Sonorous, Chemical Properties Of Metals And

Non-Metals - Reaction With Oxygen, Reaction With Water, Reactions With Acids, Reactions With Bases, Displacement Reactions, Uses Of Metals And Nonmetals

**Characteristics and Uses of Natural Resources** - Water: Uses Of Water, Sources Of Water, Evaporation, Transpiration, Formation Of Clouds, Condensation, Consequence of Heavy and No Rains, Conservation Of Water, Rainwater Harvesting, Techniques Of Rainwater Harvesting; Air: Composition Of Air, Oxygen, Replacing Oxygen In The Atmosphere; Soil: Soil Profile, Humus, Weathering, B-Horizon, C-Horizon, Bedrock; Soil Types, Properties Of Soil, Percolation Rate Of Water In Soil, Moisture In Soil, Absorption Of Water By Soil, Soil And Crops, Soil Erosion, Different Types Of Soils for Different Types Of Crops, Inexhaustible Natural Resources, Exhaustible Natural Resources, Coal, Products Such As Coke, Coal Tar And Coal Gas, Petroleum, Refining Of Petroleum, Petroleum Refinery, Natural Gas

**Pollution and its Control** - Dealing With Garbage, Landfill, Composting, Burning Of Waste, Vermicomposting, Recycling, Recycling Of Paper and Plastic, Air Pollution And Pollutants, Carbon Monoxide, Smog, Sulphur Dioxide And Nitrogen Dioxide, Chlorofluorocarbons (Cfcs), Acid Rain, Greenhouse gases, Greenhouse Effect, Global Warming, Water Pollutants, Industrial Waste, Agricultural runoffs and their effect on aquatic ecosystems, Potable Water And Water Purification

**Fibre to Fabric** - Properties and Uses of Materials: Fibre, Natural Fibres, Artificial Fibres, Cotton, Jute, Spinning Cotton, Yarn, Yarn To Fabric, Weaving, Knitting, Wool, Processing Fibres Into Wool, Silk, Sericulture, Life History Of Silk Moth, Rearing Silkworms, Processing Silk, Objects And The Materials They Are Made Of, Appearance, Hardness, Solubility, Floating and Sinking, Transparency

**Separation of Materials** - Hand Picking, Threshing, Winnowing, Sieving, Sedimentation, Decantation And Filtration, Evaporation, Use Of More Than One Method Of Separation, Saturation

**Synthetic fibers and Plastics** - Synthetic Fibres, Polymer, Types Of Synthetic Fibres, Rayon, Nylon, Use Of Nylon Fibres, Polyester And Acrylic, Petrochemicals, Characteristics Of Synthetic Fibres, Plastics, Polythene, Thermoplastics, Thermosetting, Plastics As Materials Of Choice, Non-Reactive nature of Plastic, Properties Of Plastic, Plastics And The Environment, Non-Biodegradable, 3R Principle- Reduce, Reuse, Recycle And Recover

## Physics

**Properties of Light** - Transparent, Translucent And Opaque Objects Shadows, Pinhole Camera, Upside Down Images, Light Travels along a straight line, Visibility, Incident Ray, Reflected Ray, Normal To The Reflecting Surface, Angle Of Incidence And Angle Of Reflection, Law Of Reflection, Colour Of Sunlight

**Optical Devices** - Plane Mirrors, Reflection In Mirrors, Simple Periscope Using Mirrors, Light Travels Along A Straight Line, Reflection Of Light, Right Or Left, Playing With Spherical Mirrors, Concave Mirrors, Convex Mirror, Real Images, Virtual Image, Character Of The Image, Images Formed By Lenses, Convex Mirror, Concave Mirror, Splitting Of Sunlight Using Prism, Newton's Disc, Image Formation In A Plane Mirror, Lateral Inversion, Regular And Diffused Reflection, Multiple Reflections, Multiple Images, Kaleidoscope

**Space** - The Moon, Phases Of The Moon, The Moon's Surface, The Stars, Light Year, The Pole Star, Constellations, Ursa Major, Orion, Cassiopeia, The Solar System, The Sun, The Planets, Orbit, Satellite, Tilted Axis, Asteroids, Comets, Meteors And Meteorites, Artificial Satellites

**Earth's Interior** - Earthquakes, Causes Of An Earthquake, Tectonic Plates, Movements Of Earth's Plates, Seismic Or Fault Zones, Richter Scale, Seismograph, Protection Against Earthquakes

**Measurement** - Measuring Length Unit, Standard Units Of Measurement, Correct Measurement Of Length, Metric System, International System Of Units (SI Units), Measurement Of Height, Errors In Taking Observations, Measuring the length of a curved line with a thread

**Types and Characteristics of Motion** - Types of Motions, Rectilinear Motion, Circular Motion, Periodic and Non-periodic Motion, Combinations of Different Types of Motion

**Motion and Time** - Speed, Non-Uniform Motion, Uniform Motion, Measurement Of Time, Simple Pendulum, Periodic and Oscillatory Motion, Units Of Time And Speed, Measuring Speed, Speedometer, Distance-Time Graphs

**Types and Properties of Force** - Interactions giving rise to Forces, Forces acting in the same direction, Forces acting in the opposite directions, Magnitude Of Force, Ability of Force to change the state of Motion, State Of Motion, Ability of Force to change the shape of an object, Contact Forces, Non-Contact Forces, Magnetic Force, Electrostatic Force, Gravitational Force, Pressure, Pressure Exerted By Liquids And Gases, Pressure On The Walls Of The Container, Atmospheric Pressure

**Friction** - Force Of Friction, Factors Affecting Friction, Spring Balance, Surface Irregularities, Friction: A Necessary Evil, Friction producing Heat, Increasing And Reducing Friction, Lubricants, Wheels, Reduce Friction, Rolling Friction, Sliding Friction, Fluid Friction, Drag

**Characteristics of Mechanical Waves** - Sound Produced By A Vibrating Body, Vibration, Musical Instruments, Sound Needs A Medium For Propagation, Amplitude, Time Period And Frequency Of A Vibration, Oscillatory Motion, Hertz, Amplitude, Loudness And Pitch, Noise And Music, Noise Pollution, Measures To Limit Noise Pollution

**Properties of Electric Charge** - Lightning, Electric Charges, Charging By Rubbing, Charged Objects, Types Of Charges And Their Interaction, Convention Of Positive And Negative Charge, Transfer Of Charge, Electroscope, Earthing, Lightning Safety

**Electric Components** - Electric Cell, Torch Bulb, Positive And Negative Terminals, Bulb,

Connected to an Electric Cell, Electric Circuit, Current Flow, Direction Of Current Flow, Electric Switch, Conductors And Insulators, Symbols of Electric Components, Electric circuit components, Battery, Circuit Diagram, Heating Effect of Electric Current, Heating Element, Electric Fuses, Magnetic Effects Of Electric Current, Electromagnet, Electric Bell

**Chemical Effects of Electric Current** - Liquids conducting Electricity, Chemical Effects Of Electric Current, Electrodes, Electroplating, Chromium Plating, Corrosion Protection

**Properties of Magnetic Materials** - Magnetic And Non-Magnetic Materials, Magnetic Objects, Poles of a Magnet, Iron Filings Sticking to a Bar Magnet, Compass, Making a Magnet, Attraction And Repulsion Of Magnets, Loss of Magnetic Properties

**Eye** - Cornea, Iris, Pupil, Optic Nerve, Blind Spot, Care Of Eyes, Visual impairment, Braille System

**Voice and Ears** - Sound Produced By Humans, Voice Box Or The Larynx, Vocal Cords, Sound perceived by the Ears , Eardrum, Audible And Inaudible Sounds, Hearing Impairment