

**Class VI (Science)**

Suggested Pedagogical Processes	Learning Outcomes
<p><b>The learner may be provided opportunities in pairs/ groups/ individually and encouraged to:</b></p> <ul style="list-style-type: none"> <li>➤ explore surroundings, natural processes, phenomena using senses viz. seeing, touching, tasting, smelling, hearing.</li> <li>➤ pose questions and find answers through reflection, discussion, designing and performing appropriate activities, role plays, debates, use of ICT, etc.</li> <li>➤ record the observations during the activity, experiments, surveys, field trips, etc.</li> <li>➤ analyse recorded data, interpret results and draw inference/ make generalisations and share findings with peers and adults.</li> <li>➤ exhibit creativity presenting novel ideas, new designs/patterns, improvisation, etc.</li> <li>➤ internalise, acquire and appreciate values such as cooperation, collaboration, honest reporting, judicious use of resources, etc</li> <li>➤ use diagrams, models and audio-visual materials to understand motions of the earth.</li> <li>➤ observe stars, planets, satellite (Moon), eclipse under the guidance of parents/teacher/elders, etc. to understand astronomical phenomena.</li> <li>➤ use globe for understanding latitudes and longitudes</li> <li>➤ use diagrams for understanding lithosphere, hydrosphere, atmosphere and biosphere</li> <li>➤ explore maps for locating continents, oceans, seas, States/UTs of India, India and its neighbouring countries, physical feature of India such as mountains, plateaus, plains, deserts, rivers, etc.</li> <li>➤ discuss superstitions linked to eclipses.</li> <li>➤ use pictures, drawings of different types of sources to read, explain, discuss these to understand how historians have interpreted these to reconstruct history of ancient India</li> <li>➤ undertake map activity: for locating important places, sites of hunter-gatherers-food producers, Harappan civilization, <i>janapadas</i>, <i>mahajanapadas</i>, empires, places related to events in the life of the Buddha and Mahavira- centres of art and architecture-areas outside India with which India had contacts.</li> <li>➤ explore epics, Ramayana, Mahabharata, Silappadikaram, Manimekalai or some important works by Kalidas etc.</li> </ul>	<p><b>The learner:</b></p> <ul style="list-style-type: none"> <li>• identifies materials and organisms, such as, plant fibres, flowers, on the basis of observable features i.e. appearance, texture, function, aroma, etc.</li> <li>• differentiates materials and organisms, such as, fibre and yarn; tap and fibrous roots; electrical conductors and insulators; on the basis of their properties, structure and functions</li> <li>• classifies materials, organisms and processes based on observable properties, e.g., materials as soluble, insoluble, transparent, translucent and opaque; changes as can be reversed and cannot be reversed; plants as herbs, shrubs, trees, creeper, climbers; components of habitat as biotic and abiotic; motion as rectilinear, circular, periodic</li> <li>• conducts simple investigations to seek answers to queries, e.g., What are the food nutrients present in animal fodder? Can all physical changes be reversed? Does a freely suspended magnet align in a particular direction?</li> <li>• relates processes and phenomenon with causes, e.g., deficiency diseases with diet; adaptations of animals and plants with their habitats; quality of air with pollutants, etc.</li> <li>• explains processes and phenomenon, e.g., processing of plant fibres; movements in plants and animals; formation of shadows; reflection of light from plane mirror; variations in composition of air; preparation of vermicompost, etc.</li> <li>• measures physical quantities and expresses in SI units, e.g., length</li> <li>• draws labelled diagrams / flow charts of organisms and processes, e.g., parts of flowers; joints; filtration; water cycle, etc.</li> <li>• constructs models using materials from surroundings and explains their working, e.g., pinhole camera, periscope, electric torch, etc.</li> <li>• applies learning of scientific concepts in day-to-day life, e.g., selecting food items for a balanced diet; separating materials; selecting season appropriate fabrics; using compass needle for finding directions; suggesting ways to cope with heavy rain/ drought, etc.</li> <li>• makes efforts to protect environment, e.g., minimising wastage of food, water, electricity and generation of waste; spreading awareness to adopt rain water harvesting; care for plants, etc.</li> <li>• exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices</li> <li>• distinguishes between stars, planets and satellites e.g. Sun, Earth and Moon.</li> <li>• recognizes that the earth is a unique celestial body due to existence of life, zones of the earth with special reference to biosphere.</li> </ul>

- discuss: basic ideas and central values of Buddhism, Jainism and other systems of thought- relevance of their teachings today development of art and architecture in ancient India-India's contribution in the area of culture and science
- role play: on various historical themes like change of Ashoka after Kalinga War-one of the events, incidents from literary works of the time etc.
- undertake projects: on the evolution of state-working of *ganas* or *sanghas*- contributions of kingdoms, dynasties in the field of culture-India's contact with areas outside India highlighting the impact of these contacts and classroom discussion on projects
- visit to museum: to see the material remains of early human settlements- Harappan and discuss the continuity and change between these cultures.
- participate in a discussion on the concepts of diversity, discrimination, government, and livelihood.
- observe examples of fair/unfair treatments to people meted out in the family, school, society, etc.
- study from the text and direct observation of functioning of a *Gram Panchayat* or a municipality/corporation (according to the place a student lives).
- understand the role of governance in society, and the difference
- between affairs of a family and those of a village/city.
- describe case studies of nearby localities/villages in respect of occupations.

- demonstrates day & night and seasons.
- locates directions on the flat surface and continents & oceans on the world map..
- identifies latitudes and longitudes, e.g., poles, equator, tropics, States/UTs of India and other neighbouring countries on globe and the world map,
- locates physical features of India such as mountains, plateaus, plains, rivers, desert, etc. on the map of India.
- draws neighbourhood map showing scale, direction, and features with the help of conventional symbols.
- examines critically the superstitions related to eclipses.
- identifies different types of sources (archaeological, literary etc.) and describes their use in reconstruction of history of this period.
- locates important historical sites, places on an outline map of India.
- recognises distinctive features of early human cultures and
- explains their growth.
- lists out significant contributions of important kingdoms, dynasties with examples viz., Ashokan inscriptions, Gupta coins, Rath temples by Pallavas etc.
- explains broad developments during ancient period e.g. hunting gathering stage, the beginning of agriculture, the first cities on the Indus etc. and relates the developments occurring in one place with another.
- describes issues, events, personalities mentioned in literary works of the time.
- describes the implications of India's contacts with regions outside India in the fields of religion, art, architecture, etc.
- outlines India's significant contributions in culture and science viz. astronomy, medicine, mathematics, and knowledge of metals, etc.
- synthesizes information related to various historical developments.
- analyses basic ideas and values of various religions and systems of thought during ancient period.
- describes various forms of human diversity around her/him.
- develops a healthy attitude towards various kinds of diversity around her/him.
- recognises various forms of discrimination and understands the nature and sources of discrimination.
- differentiates between equality and inequality in various forms to treat them in a healthy way.
- describes the role of government, especially at the local level.
- identifies various levels of the government – local, state and union.
- analyses the functioning of rural and urban local government bodies in sectors like health and education.
- describes factors responsible for availability of different occupations undertaken in rural and urban areas.

**Class VII ( Science )**

Suggested Pedagogical Processes	Learning Outcomes
<p><b>The learner is to be provided with opportunities in pairs/groups/ individually in an inclusive setup and encouraged to:</b></p> <ul style="list-style-type: none"> <li>• explore surroundings, natural processes, phenomena using senses viz. seeing, touching, tasting, smelling, hearing.</li> <li>• pose questions and find answers through reflection, discussion, designing and performing appropriate activities, role plays, debates, use of ICT, etc.</li> <li>• record the observations during the activity, experiments, surveys, field trips, etc.</li> <li>• analyse recorded data, interpret results and draw inference/ make generalisations and share findings with peers and adults.</li> <li>• exhibit creativity presenting novel ideas, new designs/patterns, improvisation, etc.</li> <li>• internalise, acquire and appreciate values such as cooperation, collaboration, honest reporting, judicious use of resources, etc</li> </ul>	<ul style="list-style-type: none"> <li>• neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function classifies materials and organisms based on properties/characteristics, e.g., plant and animal fibres; physical and chemical changes conducts simple investigations to seek answers to queries ,e.g., Can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?</li> <li>• relates processes and phenomenon with causes, e.g., wind speed with air pressure; crops grown with types of soil ; depletion of water table with human activities, etc.</li> <li>• explains processes and phenomenon , e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants ; heating and magnetic effects of electric current, etc.</li> <li>• writes word equation for chemical reactions, e.g., acid-base reactions; corrosion; photosynthesis; respiration, etc.</li> <li>• measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc.</li> <li>• plots and interprets graphs e.g., distance-time graph</li> <li>• constructs models using materials from surroundings and explains their working ,e.g., stethoscope; anemometer; electromagnets; Newton"s colour disc ,etc.</li> <li>• discusses and appreciates stories of scientific discoveries</li> <li>• applies learning of scientific concepts in day-to-day life, e.g. dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in proper order in devices; taking</li> <li>• measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.</li> <li>• makes efforts to protect environment, e.g., following good practices for sanitation at public places; minimising generation of pollutants; planting trees to avoid soil erosion; sensitising others with the consequences of excessive consumption of natural resources, etc.</li> <li>• exhibits creativity in designing, planning, making use of available resources, etc.</li> <li>• exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices</li> </ul>

## Class VIII ( Science)

Suggested Pedagogical Processes	Learning Outcomes
<p><b>The learner is to be provided with opportunities in pairs/groups/ individually in an inclusive setup and encouraged to:</b></p> <ul style="list-style-type: none"> <li>• explore surroundings, natural processes, phenomena using senses viz. seeing, touching, tasting, smelling, hearing.</li> <li>• pose questions and find answers through reflection, discussion, designing and performing appropriate activities, role plays, debates, use of ICT, etc.</li> <li>• record the observations during the activity, experiments, surveys, field trips, etc.</li> <li>• analyse recorded data, interpret results and draw inference/ make generalisations and share findings with peers and adults.</li> <li>• exhibit creativity presenting novel ideas, new designs/patterns, improvisation, etc.</li> <li>• internalise, acquire and appreciate values such as cooperation, collaboration, honest reporting, judicious use of resources, etc</li> </ul>	<p><b>The learner:</b></p> <ul style="list-style-type: none"> <li>• differentiates materials and organisms, such as, natural and human made fibres; contact and non-contact forces; liquids as electrical conductors and insulators; plant and animal cells; viviparous and oviparous animals, on the basis of their properties, structure and functions.</li> <li>• classifies materials and organisms based on properties/ characteristics, e.g., metals and non metals; <i>kharif</i> and <i>rabi</i> crops; useful and harmful microorganisms; sexual and asexual reproduction; celestial objects; exhaustible and inexhaustible natural resources, etc.</li> <li>• conducts simple investigations to seek answers to queries ,e.g, What are the conditions required for combustion? Why do we add salt and sugar in pickles and <i>murabbas</i>? Do liquids exert equal pressure at the same depth?</li> <li>• relates processes and phenomenon with causes ,e.g., smog formation with the presence of pollutants in air; deterioration of monuments with acid rain, etc.</li> <li>• explains processes and phenomenon ,e.g., reproduction in human and animals; production and propagation of sound; chemical effects of electric current; formation of multiple images; structure of flame, etc.</li> <li>• writes word equation for chemical reactions, e.g., reactions of metals and non-metals with air, water and acids ,etc.</li> <li>• measures angles of incidence and reflection, etc.</li> <li>• prepares slides of microorganisms; onion peel , human cheek cells ,etc., and describes their microscopic features..</li> <li>• draws labelled diagram/ flow charts, e.g., structure of cell, eye, human reproductive organs; experimental set ups, etc.</li> <li>• constructs models using materials from surroundings and explains their working , e.g. , <i>ektara</i>, electroscope, fire extinguisher, etc.</li> <li>• applies learning of scientific concepts in day-to-day life, e.g., purifying water; segregating biodegradable and non-biodegradable wastes; increasing crop production; using appropriate metals and non-metals for various purposes; increasing/ reducing friction; challenging myths and taboos regarding adolescence, etc.</li> <li>• discusses and appreciates stories of scientific discoveries</li> <li>• makes efforts to protect environment, e.g., using resources judiciously; making controlled use of fertilisers and pesticides; suggesting ways to cope with environmental hazards, etc.</li> <li>• exhibits creativity in designing, planning, making use of available resources, etc.</li> <li>• exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices</li> </ul>