CLASS VIII
SCIENCE

Questions	Key Concepts	Resources	Activities/ Processes
1. Food			**(Periods - 22)**
Crop production			
Crop production: How are different food crops produced? What are the various foods we get from animal sources?	Crop production: Soil preparation, selection of seeds, sowing, applying fertilizers, irrigation, weeding, harvesting and storage; nitrogen fixation, nitrogen cycle.	Interaction and discussion with local men and women farmers about farming and farm practices; visit to cold storage, go- downs; visit to any farm/ nursery/ garden.	Preparing herbarium specimens of some crop plants; collection of some seeds etc; preparing a table/chart on different irrigation practices and sources of water in different parts of India; looking at roots of any legume crop for nodules, hand section of nodules.
Micro-organisms			
What living organisms do we see under a microscope in a drop of water? What helps make curd? How does food go bad? How do we preserve food?	Micro organisms – useful and harmful.	Microscope, kit materials; information about techniques of food preservation.	Making a lens with a bulb; Observation of drop of water, curd, other sources, bread mould, orange mould under the microscope; experiment showing fermentation of dough – increase in volume (using yeast) – collect gas in balloon, test in lime water.
2. Materials			**(Periods - 26)**
Materials in daily life			
Are some of our clothes synthetic? How are they made? Where do the raw materials come from?	Synthetic clothing materials. Other synthetic materials, especially plastics;	Sharing of prior knowledge, source materials on petroleum products.	Survey on use of synthetic materials. Discussion.

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Do we use other materials that are synthetic?	usefulness of plastics and problems associated with their excessive use.		
Do we use cloth (fabric) for purposes other than making clothes to wear? What kind of fabric do we see around us? What are they used for?	There are a variety of fibrous materials in use. A material is chosen based on desired property.	Collection of material from neighbourhood or should be part of the kit.	Testing various materials – for action of water, reaction on heating, effect of flame, electrical conductivity, thermal conductivity, tensile strength.
Different kinds of materials and their reactions.			
Can a wire be drawn out of wood? Do copper or aluminium also rust like iron? What is the black material inside a pencil? Why are electrical wires made of aluminium or copper?	Metals and non-metals.	Kit items.	Simple observations relating to physical properties of metals and non-metals, displacement reactions, experiments involving reactions with acids and bases. Introduction of word equations.
How things change/ react with one another			
What happens to the wax when a candle is burnt? Is it possible to get this wax back?	Combustion, flame	"The Chemical History of a Candle", by M. Faraday, 1860.	Experiments with candles.
What happens to kerosene/natural gas when it is burnt? Which fuel is the best? Why?	All fuels release heat on burning. Fuels differ in efficiency, cost etc. Natural resources are limited. Burning of fuels leads to harmful by products.	Collecting information from home and other sources.	Collecting information. Discussions involving whole class.

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3. The World of the Living			**(Periods - 44)**
Why conserve			
What are reserve forests/ sanctuaries etc? How do we keep track of our plants and animals? How do we know that some species are in danger of disappearing? What would happen if you continuously cut trees?	Conservation of biodiversity/wild life/ plants; zoos, sanctuaries, forest reserves etc. flora, fauna endangered species, red data book; endemic species, migration.	Films on wild life, TV programmes, visit to zoo/ forest area/sanctuaries etc.; case study with information on dis-appearing tigers; data on endemic and endangered species from MEF, Govt. of India, NGOs .	Discussion on whether we find as many diverse plants/ animals in a 'well kept area' like a park or cultivated land, as compared to any area left alone. Discussion on depletion of wild life, why it happens, on poaching, economics.
The cell			
What is the internal structure of a plant – what will we see if we look under the microscope? Which cells from our bodies can be easily seen? Are all cells similar?	Cell structure, plant and animal cells, use of stain to observe, cell organelles – nucleus, vacuole, chloroplast, cell membrane, cell wall.	Microscope, onion peels, epidermal peels of any leaves, petals etc, buccal cavity cells, *Spirogyra*; permanent slides of animal cells.	Use of a microscope, preparation of a slide, observation of onion peel and cheek cells, other cells from plants e.g. *Hydrilla* leaf, permanent slides showing different cells, tissues, blood smear; observation of T.S. stem to see tissues; observing diverse types of cells from plants and animals (some permanent slides).
How babies are formed			
How do babies develop inside the mother? Why does our body change when we reach our teens? How is the sex of the child determined? Who looks after the babies in your homes? Do all	Sexual reproduction and endocrine system in animals, secondary sexual characters, reproductive health; internal and external fertilisation.	Counsellors, films, lectures.	Discussion with counsellors on secondary sexual characters, on how sex of the child is determined, safe sex, reproductive health; observation on eggs, young ones, life cycles.

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animals give birth to young ones?			Discussion on Gender issues and social taboo's.
4. Moving things, People and Ideas ***Idea of force*** What happens when we push or pull anything? How can we change the speed, direction of a moving object? How can we shape the shape of an object?	Idea of force-push or pull; change in speed, direction of moving objects and shape of objects by applying force; contact and non-contact forces.	Daily-life experience, kit items.	Observing and analysing the relation between force and motion in a variety of daily-life situations. Demonstrating change in speed of a moving object, its direction of motion and shape by applying force. Measuring the weight of an object, as a force (pull) by the earth using a spring balance.
Friction What makes a ball rolling on the ground slow down?	Friction – factors affecting friction, sliding and rolling friction, moving; advantages and disadvantages of friction for the movement of automobiles, airplanes and boats/ships; increasing and reducing friction.	Various rough and smooth surfaces, ball bearings.	Demonstrating friction between rough/smooth surfaces of moving objects in contact, and wear and tear of moving objects by rubbing (eraser on paper, card board, sand paper). Activities on static, sliding and rolling friction. Studying ball bearings. Discussion on other methods of reducing friction and ways of increasing friction.

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Pressure Why are needles made pointed? Why does a balloon burst if too much air is blown into it? Why does an inverted glass/ bottle/pitcher resist being pushed down into water? How can air/liquids exert pressure?	Idea of pressure; pressure exerted by air/liquid; atmospheric pressure.	Daily-life experiences; Experimentation- improvised manometer and improvised pressure detector.	Observing the dependence of pressure exerted by a force on surface area of an object. Demonstrating that air exerts pressure in a variety of situations. Demonstrating that liquids exert pressure. Designing an improvised manometer and measuring pressure exerted by liquids. Designing improvised pressure detector and demonstrating increase in pressure exerted by a liquid at greater depths.
Sound How do we communicate through sound? How is sound produced? What characterises different sounds?	Various types of sound; sources of sound; vibration as a cause of sound; frequency; medium for propagation of sound; idea of noise as unpleasant and unwanted sound and need to minimise noise.	Daily-life experiences; kit items; musical instruments.	Demonstrating and distinguishing different types (loud and feeble, pleasant/ musical and unpleasant / noise, audible and inaudible) of sound. Producing different types of sounds. using the same source. Making a '*Jal Tarang*'. Demonstrating that vibration is the cause of sound. Designing a toy telephone. Identifying various sources of noise. (unpleasant and unwanted sound) in the

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			locality and thinking of measures to minimise noise and its hazards (noise-pollution).
5. How Things Work ***Electric current and circuits***			**(Periods - 14)**
Why do we get a shock when we touch an electric appliance with wet hands?	Water conducts electricity depending on presence/ absence of salt in it. Other liquids may or may not conduct electricity.	Rubber cap, pins, water, bulb or LED, cells, various liquids.	Activity to study whether current flows through various liquid samples (tap water, salt solution, lemon juice, kerosene, distilled water if available).
What happens to a conducting solution when electric current flows through it?	Chemical effects of current.	Carbon rods, beaker, water, bulb, battery.	Emission of gases from salt solution. Deposition of Cu from copper sulphate solution. Electric pen using KI and starch solution.
How can we coat an object with a layer of metal?	Basic idea of electroplating.	Improvised electrolytical cell, $CuSO_4$	Simple experiment to show electroplating.
6. Natural Phenomena ***Rain, thunder and lightning***			**(Periods - 26)**
What is lightning? What safety measures should we take against lightning strikes?	Clouds carry electric charge. Positive and negative charges, attraction and repulsion. Principle of lightning conductor.	Articles on clouds and lightning; kit items.	Discussion on sparks. Experiments with comb and paper to show positive and negative charge. Discussion on lightning conductor.
Light What are the differences	Laws of reflection.	Mirror, source of light,	Exploring laws of

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between the images formed on a new utensil and an old one? Why is there this difference?		ray source (mirror covered with black paper with a thin slit).	reflection using ray source and another mirror.
When you see your image in the mirror it appears as if the left is on the right – why?	Characteristics of image formed with a plane mirror.	Plane glass, candle, scale.	Locating the reflected image using glass sheet and candles.
Why don't we see images on all surfaces around us?	Regular and diffused reflection.		Discussion with various examples.
What makes things visible?	Reflection of light from an object to the eye.	Experience.	Activity of observing an object through an object through a straight and bent tube; and discussion.
How do we see images of our back in a mirror?	Multiple reflection.	Mirrors and objects to be seen.	Observing multiple images formed by mirrors placed at angles to each other. Making a kaleidoscope.
Why do we sometimes see colours on oil films on water?	Dispersion of light.	Plane mirror, water.	Observing spectrum obtained on a white sheet of paper/wall using a plane mirror inclined on a water surface at an angle of 45°.
What is inside our eye that enables us to see?	Structure of the eye.	Model or chart of the human eye.	Observing reaction of pupil to a shining torch. Demonstration of blind spot.
Why are some people unable to see?	Lens becomes opaque, light not reaching the eye. Visually challenged use other senses to make sense of the world around.	Experiences of children; case histories. Samples of Braille sheets.	Description of case histories of visually challenged people who have been doing well in their studies and careers. Activities with Braille sheet.

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	Alternative technology available. Role of nutrition in relation to blindness		
Night sky What do we see in the sky at night? How can we identify stars and planets?	Idea about heavenly bodies/celestial objects and their classification – moon, planets, stars, constellations. Motion of celestial objects in space; the solar system.	Observation of motion of objects in the sky during the day and at night; models, charts, role-play and games, planetarium.	Observing and identifying the objects moving in the sky during the day and at night. Observing and identifying some prominent stars and constellations. Observing and identifying some prominent planets, visible to the naked eye, (Venus, Mars, Jupiter) in the night sky and their movement. Design and preparing models and charts of the solar system, constellations, etc. Role-play and games for understanding movement of planets, stars etc.
			
Earthquakes What happens during an earthquake? What can we do to minimise its effects?	Phenomena related to earthquakes.	Earthquake data; visit to seismographic centre.	Looking at structures/ large objects and guessing what will happen to them in the event of an earthquake; activities to explore stable and unstable structures.

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7. Natural Resources ***Man's intervention in phenomena of nature*** What do we do with wood? What if we had no wood? What will happen it we go on cutting trees/grass without limit?	Consequences of deforestation: scarcity of products for humans and other living beings, change in physical properties of soil, reduced rainfall. Reforestation; recycling of paper.	Data and narratives on deforestation and on movements to protect forests.	Narration and discussions. Project- Recycling of paper.
What do we do with coal and petroleum? Can we create coal and petroleum artificially?	Formation of coal and petroleum in nature. (fossil fuels?). Consequences of over extraction of coal and petroleum.	Background materials, charts etc.	Discussion.
Pollution of air and water What are the various activities by human beings that make air impure? Does clear, transparent water indicate purity?	Water and air are increasingly getting polluted and therefore become scarce for use. Biological and chemical contamination of water; effect of impure water on soil and living beings; effect of soil containing excess of fertilisers and insecticides on water resources. Potable water.	Description of some specific examples of extremely polluted rivers.	Case study and discussion. Purification of water by physical and chemical methods including using sunlight. Discussion on other methods of water purification.