

JHARKHAND BOARD CLASS 10
SCIENCE SYLLABUS

SCIENCE CLASS X

Theme/ Sub-theme	Questions	Key concepts	Resources	Activities/ Processes
1. Food 2. Materials Different kinds of materials	Why are some substances sour and some bitter in taste?	Acids, bases and salts: General properties, examples and uses.	Orange juice, lemon juice, soap solution, litmus solution, zinc,	Testing different substances with indicators.

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	<p>Why does soap solution feel slippery? Why does seawater taste salty?</p> <p>Why does iron rust? Why does painted iron not rust? Why is burning sensation removed when one takes antacids? Why do substances stop burning in the absence of air? Why is flame seen when substances burn? Can substances burn without flame? Why does a matchstick kept in the blue part of the flame not burn? Why is a red coating formed on the zinc rod when it is kept in copper sulphate solution? What is the material of the coating?</p>	<p>Types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, neutralisation, oxidation and reduction in terms of gain and loss of oxygen and hydrogen.</p>	<p>copper and aluminium metals. Acids: hydrochloric acid, sulphuric acid, nitric acid. Bases: sodium hydroxide. Common salt.</p> <p>Turmeric, limejuice, vinegar, baking soda, washing soda, yeast, hot water. Materials such as iron nails, copper strip, aluminium strip, zinc strip, galvanised strip, petri dishes with and without covers, container that can be filled with water, cotton wool, etc.</p>	<p>Neutralisation reactions (Periods 5)</p> <p>Mixing pairs of substances mentioned alongside, to see the reactions – discussion on chemistry in the kitchen, chemistry inside our bodies. Carrying out simple reactions that encompass decomposition, displacement, double displacement, precipitation, neutralisation, oxidation and reduction. (Periods 10)</p>

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How things change/react with one another.?	How do copper, silver, iron exist in nature? What is the composition of natural gas used for cooking? What is petrol? What is vinegar?	Brief discussion of basic metallurgical processes. Properties of common metals. Elementary idea about bonding. Carbon compounds, elementary idea about bonding. Saturated hydrocarbons, alcohols, carboxylic acids: (no preparation, only properties).	Samples of metals: iron, copper, lead, silver, zinc, aluminium, gold; of non-metals: sulphur, graphite; of alloys: steel, brass Models	Discussions on metallurgical processes and simple experiments involving metals, with chemical reactions. Experiments involving reactions of carbon and its compounds with chemical reactions. Use of models. (Periods 16)
Materials of common use	How is common salt obtained? Besides its use in food, is it used for other purposes? What makes washing soda and baking soda different materials? How does bleaching powder make paper and cloth white? What is the white material that is used for making casts? How do soaps clean clothes? Can some other	Soap – cleansing action of soap.	Kit containing various materials like common salt, washing soda, baking soda, lime, lime stone, bleaching powder, plaster of Paris, soaps; alcohol.	Use of kit materials for demonstration as well as performing of experiments by student of properties. Visits to factories. (Periods 8)

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How are elements classified?	<p>material be used for cleaning clothes?</p> <p>Why does a man lose control on his body after drinking alcohol?</p> <p>Why do people become blind on drinking denatured alcohol?</p> <p>How do chemists study such a large number of elements?</p>	<p>Gradations in properties:</p> <p>Mendeleev periodic table.</p>	<p>Brief historical account, charts, films etc.</p>	<p>Predicting trends on the basis of the table.</p> <p>(Periods 5)</p>
<p>3. The World of the Living</p> <p>Our Environment</p>	<p>What will happen if we bury different materials in the soil?</p> <p>What will happen if we kill all insects?</p> <p>Some of us eat meat; some do not – what about animals?</p>	<p>Our Environment: Environmental problems, what can we do? Bio degradable, non-biodegradable. Ozone depletion.</p>	<p>Discussion on food habits of animals, finding out the various waste materials produced and their disposal in different parts of the country.</p>	<p>Activity of burying different materials in the soil and studying periodically what happens; construction of food web using models, classification of some common plants and animals as consumers etc.</p> <p>(Periods 8)</p>
How do we stay alive?	<p>What are the processes needed for living?</p>	<p>Define 'living' things; Basic concept of nutrition, respiration, transport and excretion in plants and animals.</p>	<p>Models and charts of various systems in animals, and parts in plants.</p>	<p>Study various things around to decide whether they are living/non living.</p> <p>(Periods 15)</p>

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Control in the living	Why do roots grow towards the ground? Can we make them grow upwards? Why do stems grow upwards?	Tropic movements in plants; Introduction to plant hormones; Control and coordination in animals: voluntary, involuntary and reflex action, nervous system; chemical coordination: animal hormones.	Young plants for experiments, seeds; Kit materials; Pavlov's experiment on conditioned reflex.	Experiments on tropic movements in plants – geotropism, hydrotropism, phototropism, interaction of factors; experiment on apical dominance; demonstration of reflex action. (Periods 10)
Reproduction in the living	Do plants and animals have similar reproductive cycles? Can we decide how many children are born in a family?	Reproduction in plants and animals. Need for and methods of family planning. Safe sex vs. HIV/AIDS. Childbearing and women's health.	Permanent slide L.S. grain; charts/specimens of embryos, egg. Charts and other materials on family planning. Newspaper reports on HIV/AIDS.	Study pollen tube growth and pollen tubes on a stigmatic mount, mount soaked seeds to see embryonal axis, cotyledons etc., seed germination – epigeal and hypogeal; structure of the hen's egg. Discussion on family planning and responsible parenting. (Periods 10)
Heredity and evolution	Why are we like our parents? Did similar plants and animals exist in the past? Did life always exist?	Heredity; Origin of life: brief introduction; Basic concepts of evolution.	Data and worksheet from Mendel's experiments, specimen of fossil.	Phenotypic ratio 3:1, 2:1, 9:3:3:1 (Periods 10)

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<p>4. Moving Things, People and Ideas</p> <p>5. How things work</p> <p>Electric Circuits</p>	<p>In which direction does current flow inside a conductor?</p> <p>How is potential difference across a conductor related to current through the conductor?</p> <p>How can you arrange a given set of resistors so that the same current flows through all?</p>	<p>Potential difference, potential.</p> <p>Ohm's law</p> <p>Series combination of resistances.</p>	<p>Battery, conductor voltmeter, ammeter, connecting wire, key.</p> <p>-do- And rheostats</p> <p>-do- and given set of resistors.</p>	<p>Using a simple electric circuit, show that charges flow from higher potential to lower potential. Use the analogy of flow of water from higher (potential to highest energy) lower height (lower potential energy).</p> <p>Using a circuit consisting of a conductor, battery, key, voltmeter and ammeter, establish a relationship between potential difference and current and hence Ohm's law.</p> <p>Using the Ohm's law circuit, establishing the properties of series combination and the rule for resistance.</p>

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Magnets	How are appliances connected in a house?	Parallel combination of resistances.	-do- and given set of resistors.	Establishing the rule for parallel combination of resistors.
	How much heat is generated when a current I flows through a resistor?	Power dissipated due to current. Inter relation between P , V , I and R .	Appliances based on heating effect of current in daily life.	Identification of appliances in daily life base on heating effect of current. Calculation of power in daily life situations. (Periods 12)
	How does the needle of a compass change direction when placed at different points near a magnet?	Magnetic field Field lines	A magnet, compass, white sheet, drawing board, drawing pins.	Drawing magnetic field lines in vicinity of a bar magnet.
	Does a current carrying conductor produce a magnetic field?	Field due to a current carrying wire. Field due to current carrying coil or solenoid.	A battery, a conductor, compass, key, A coil, A solenoid.	Demonstrating that a current carrying conductor produces a magnetic field. Demonstrating the magnetic field produced by a current carrying coil or solenoid.
	What happens to a current carrying conductor when it is placed in a magnetic field?	Force on current carrying conductor Fleming's left hand rule.	A small rod, stand and two wires for suspending the rod, a strong horseshoe magnet.	Demonstrating that a current carrying conductor when placed in a magnetic field experiences force.

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	How does the above effect help us to design machines to do work?	Electric motor.	Appliances using motors.	Demonstrating the working of a motor.
	What do you observe when a magnet is moved towards a wire connected to a galvanometer?	Electromagnetic induction. Induced potential differences, induced current.	Two coils of wire, a magnet, a galvanometer. Iron nails, battery, switch.	Identifying the appliances based on electric motors. Demonstrating the phenomenon of electromagnetic induction. Demonstrating that current is induced in a coil kept near a coil in which current changes.
	How can the phenomenon of electromagnetic induction be used to design a device to generate electricity?	Electric generator. principle and working.	A simple model of electric generator.	Demonstrating the principle and working of a generator.
	Does the current produced by a generator have the same direction all the time?	Direct current. Alternating current; frequency of AC. Advantage of AC over DC.	Model of electric generator.	Familiarising with voltage and frequency of AC in our homes.
	How are the bulbs etc. connected to the AC source in our homes?	Domestic electric circuits.	Demonstration board for domestic electric circuit.	Explaining the working of domestic electric circuits. Demonstrating the

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<p>6. Natural Phenomena</p>	<p>Why is paper burnt when light passing through a lens strikes it?</p> <p>Does a spherical mirror also exhibit similar phenomenon? Can we see a full image of a tall building using a small mirror?</p> <p>Why does a spoon partly immersed in water in a transparent glass appear broken at the level of water when viewed from the sides?</p> <p>What do lenses do? How do they correct defects in vision?</p>	<p>Convergence and divergence of light.</p> <p>Images formed by a concave mirror; related concepts centre of curvature, principal axis. Optical centre, focus, focal length.</p> <p>Refraction; laws of refraction.</p> <p>Images formed by a convex lens; functioning of lens in human eye; problems of vision and remedies.</p>	<p>Experience. Double convex lens.</p> <p>A candle, stand to hold a mirror, meter scale.</p> <p>Glass slab, pins.</p> <p>Convex lens.</p>	<p>use of a fuse in domestic circuit. (Periods 12)</p> <p>Observation of convergence and divergence with lenses.</p> <p>Exploring and recording features of images formed by a concave mirror, by placing an object beyond c.c., between c.c. and focus, and between pole and focus; ray diagrams.</p> <p>Activity to explore laws of refraction.</p> <p>Activity exploring and recording features of images formed by convex lens. Ray diagrams. Studying the glasses used by</p>

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	Why does the path of light change on entering a different medium?	Application of spherical mirrors and lenses. Appreciation of concept of refraction; velocity of light; refractive index; twinkling of stars; dispersion of light.	Concepts learnt earlier.	human beings to correct different vision defects. Activities studying refraction.
	Why or how does a prism disperse light?	Dispersion of light.	Prism, pins.	Observation of objects through prisms; tracing rays refracted through a prism; discussion.
	Why is the sky blue?	Scattering of light.	Observations and experience.	Activity showing scattering of light in emulsion etc. (Periods 25)
7. Natural Resources Conservation of Natural Resources	How can we contribute to protect environment in our locality? What are the major global environmental issues of direct relevance to us?	Management of natural resources. Conservation and judicious use of natural resources. Forest and wild life, coal and petroleum conservation.	Articles/stories on conservation; Posters on environmental awareness.	Case studies with focus on commercial activities exploiting natural resources. Effect of these on varies cycles in natures.

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The regional environment	What are the steps expected on the part of local administration to maintain balances in nature in your region? How can we help?	People's participation. Chipko movement. Legal perspectives in conservation and international scenario.	Case studies on Chipko movement; CNG use.	Making posters/ slogans for creating awareness.
	How does the construction of big dams affect the life of the people and the regional environment? Are rivers, lakes, forests and wild life safe in your area?	Big dams: advantages and limitations; alternatives if any. Water harvesting. Sustainability of natural resources.	Case study material on dams. Resource material on water harvesting.	Case studies with focus on issues of construction of dams and related phenomena (actual/ probable). Debates on issues involved.
Sources of energy	What are the various sources of energy we use? Are any of these sources limited? Are there reasons to prefer some of them over others?	Different forms of energy, leading to different sources for human use: fossil fuels, solar energy; biogas; wind, water and tidal energy; nuclear energy. Renewable versus non-renewable sources.	Experience; print material on various sources of energy; materials to make a solar heater.	Discussion. Making models and charts in groups. Making a solar heater/cooker. (Periods 8)