CBSE NCERT · Class 10 · Science

Science

PADIKAM LEARNING CONTENT
PADIKAM
NCERT Class 10
Science
Class 10 Study Notes
15 chapters
Thirteen current chapters plus two clearly labelled formative-reading lessons for complete textbook continuity.
Padikam explanations are independently written. The NCERT book is used only for chapter order, standard terminology and coverage.

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How to use this note
Read the quick understanding first, recall the key points aloud, then answer the exam prompts without looking back.
Official book source
https://ncert.nic.in/textbook.php?jesc1=0-13

LESSON 1
Chemical Reactions and Equations
Quick understanding
Read a chemical equation as a record of reactants, products and conserved atoms.
Must remember Exam practice
Balance atoms without changing chemical formulae. Balance Fe + H2O -> Fe3O4 + H2.
Identify combination, decomposition, displacement, Identify oxidation and reduction in CuO + double displacement and redox reactions. H2 -> Cu + H2O.
Corrosion and rancidity are everyday oxidation effects.
Formula and notation
mass of reactants = mass of products
Watch this: Change coefficients only; never alter subscripts to balance an equation.
One-line recall Balance atoms without changing chemical formulae.

LESSON 2
Acids, Bases and Salts

Quick understanding
Relate H+ and OH- ions to indicators, pH, neutralisation and useful salts.
Must remember Exam practice
Acids give H+ in aqueous solution; bases give OH-. Explain why dry HCl does not change dry litmus.
pH below 7 is acidic, 7 neutral and above 7 basic.
Write the reaction of baking soda with an
Know preparation and uses of baking soda, washing
acid.
soda, bleaching powder and plaster of Paris.
Formula and notation
pH = -log10[H+]
Watch this: Strength and concentration are different ideas.
One-line recall Acids give H+ in aqueous solution; bases give OH-.
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LESSON 3
Metals and Non-metals
Quick understanding
Use physical properties and electron transfer to explain reactions, ionic compounds and extraction.
Must remember Exam practice
The reactivity series predicts displacement and Explain formation of MgCl2 by electron
extraction method. transfer.
Metals lose electrons to form cations; non-metals Why is aluminium extracted by
gain electrons. electrolysis?
Corrosion can be reduced by painting, oiling,
alloying or galvanising.
Formula and notation
M -> M^n+ + ne-
Watch this: Do not infer reactivity from appearance alone.
One-line recall The reactivity series predicts displacement and extraction method.
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LESSON 4
Carbon and its Compounds
Quick understanding
Understand carbon's covalent bonding, tetravalency, chains, functional groups and important reactions.
Must remember Exam practice
Homologous-series members differ by CH2. Name CH3CH2OH and CH3COOH and
state their functional groups.
Saturated compounds have single bonds;
unsaturated compounds have double or triple bonds. Explain esterification with an equation.
Soap forms micelles; detergents work better in hard
water.
Formula and notation
CnH2n+2 (alkanes)
CnH2n (alkenes)
Watch this: Number the longest chain from the end nearest the functional group.
One-line recall Homologous-series members differ by CH2.
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LESSON 5
Life Processes
Quick understanding

See nutrition, respiration, transport and excretion as coordinated processes that maintain life.
Must remember Exam practice
Photosynthesis stores light energy in glucose. Trace blood through the four chambers
of the heart.
Aerobic respiration releases more energy than
anaerobic respiration. Compare alveoli and villi as exchange
surfaces.
Xylem carries water; phloem transports food;
nephrons filter blood.
Formula and notation
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
Watch this: Breathing is gas movement; respiration is cellular energy release.
One-line recall Photosynthesis stores light energy in glucose.
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LESSON 6
Control and Coordination
Quick understanding
Compare rapid electrical control through nerves with slower chemical control through hormones.
Must remember Exam practice
Areflex arc gives a rapid protective response. Draw and label a reflex arc.
The brain coordinates sensory input, movement, Compare nervous and hormonal
balance and involuntary functions. coordination.
Plant tropisms are directional growth responses.
Formula and notation
stimulus -> receptor -> coordinator -> effector -> response
Watch this: Reflex actions still involve the nervous system even when the brain is not the first decision
centre.
One-line recall Areflex arc gives a rapid protective response.
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LESSON 7
How do Organisms Reproduce?
Quick understanding
Connect reproduction with continuity, variation and specialised structures in plants and humans.
Must remember Exam practice
Asexual reproduction uses one parent and usually Compare binary fission and budding.
produces little variation.
Explain pollination, fertilisation and seed
Sexual reproduction combines genetic material from formation.
two gametes.
Puberty, fertilisation, implantation and contraception
are distinct stages or ideas.
Watch this: Reproduction is essential for continuity of a species, not survival of one individual.
One-line recall Asexual reproduction uses one parent and usually produces little variation.
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LESSON 8
Heredity
Quick understanding
Use genes, chromosomes and crosses to explain inheritance and variation across generations.
Must remember Exam practice
Atrait may be dominant or recessive in a given Complete a monohybrid Punnett square.
cross.
Distinguish inherited and acquired traits.

Mendel's monohybrid cross gives a 3:1 phenotype
ratio in F2 under simple dominance.
In humans, the sperm contributes X or Y and
therefore determines chromosomal sex.
Formula and notation
Phenotype ratio = 3:1
Genotype ratio = 1:2:1
Watch this: Dominant does not mean common, stronger or better.
One-line recall A trait may be dominant or recessive in a given cross.
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LESSON 9
Light - Reflection and Refraction
Quick understanding
Predict image position and size using ray diagrams, sign convention and formulae.
Must remember Exam practice
Use at least two standard rays in a ray diagram. Draw the image for an object between F
and 2F of a convex lens.
Mirror and lens formulae use signed distances.
Solve a numerical using the mirror
Power is positive for converging lenses and negative
formula.
for diverging lenses.
Formula and notation
1/f = 1/v + 1/u (mirror)
1/f = 1/v - 1/u (lens)
P = 1/f (f in metres)
Watch this: Apply the Cartesian sign convention before substituting values.
One-line recall Use at least two standard rays in a ray diagram.
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LESSON 10
The Human Eye and the Colourful World
Quick understanding
Explain vision, common defects and atmospheric optical effects.
Must remember Exam practice
Accommodation changes focal length to focus near Draw correction of myopia.
or distant objects.
Why do stars twinkle but planets usually
Myopia is corrected by a concave lens; do not?
hypermetropia by a convex lens.
Scattering explains blue sky and reddish sunrise or
sunset.
Formula and notation
P = 1/f
Watch this: Dispersion separates colours; scattering redirects light.
One-line recall Accommodation changes focal length to focus near or distant objects.
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LESSON 11
Electricity
Quick understanding
Connect current, potential difference, resistance, energy and power in circuits.
Must remember Exam practice
Ohm's law applies at constant physical conditions. Find current and power in a 6 ohm

resistor across 12 V.
Series resistances add; parallel combinations reduce equivalent resistance. Compare two resistors in series and parallel.
Electrical energy becomes heat according to Joule's law.
Formula and notation
V = IR
P = VI = I^2R = V^2/R
H = I^2Rt
Watch this: Convert minutes to seconds and kilowatt-hours carefully.
One-line recall Ohm's law applies at constant physical conditions.
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LESSON 12
Magnetic Effects of Electric Current
Quick understanding
Relate current to magnetic fields, force, induction, motors and domestic safety.
Must remember Exam practice
Right-hand thumb rule gives field direction around a conductor.
Sketch field lines around a solenoid.
Explain the working principle of an electric motor.
Fleming's left-hand rule applies to motor force; right-hand rule to induced current.
A fuse or MCB protects against excessive current; earthing protects the user.
Watch this: Do not interchange Fleming's left-hand and right-hand rules.
One-line recall Right-hand thumb rule gives field direction around a conductor.
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LESSON 13
Our Environment
Quick understanding
Trace energy and matter through ecosystems and evaluate human effects on natural systems.
Must remember Exam practice
A food chain shows transfer of energy; only a small fraction reaches the next level.
Build a four-level food chain and identify trophic levels.
Biodegradable waste can be decomposed; persistent materials accumulate.
Explain biomagnification using a pesticide example.
Ozone protects life from harmful ultraviolet radiation.
Formula and notation
Energy transfer to next level is about 10%
Watch this: Energy flows one way; nutrients are recycled.
One-line recall A food chain shows transfer of energy; only a small fraction reaches the next level.
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LESSON 14
Formative Reading: Periodic Classification of Elements
Quick understanding
Use the historical development and modern arrangement of the periodic table to connect electronic configuration with recurring properties.
Must remember Exam practice
Mendeleev arranged elements mainly by atomic mass and left gaps for predicted elements.
Compare Mendeleev and modern periodic laws.

Modern periodic law uses atomic number, removing Use an electronic configuration to predict
important anomalies in mass-based order. period and chemical tendency.
Period number follows occupied shells; related
valence configurations explain group similarities.
Formula and notation
Modern periodic law: properties are periodic functions of atomic number
Watch this: This is enrichment and formative reading; follow the school notice for summative
assessment.
One-line recall Mendeleev arranged elements mainly by atomic mass and left gaps for predicted elements.

LESSON 15
Formative Reading: Evolution
Quick understanding
Explain how heritable variation, selection and long periods of time produce population change and
common descent.
Must remember Exam practice
Variation arises through mutation and recombination; Distinguish natural selection from an
only heritable variation directly contributes to organism choosing to adapt.
evolutionary change.
Explain how homologous structures
Natural selection changes the frequency of traits support evolution.
through unequal survival and reproduction.
Fossils, homologous structures and molecular
similarities provide evidence of shared ancestry.
Watch this: Evolution describes population change across generations, not a ladder of progress or a
change caused by need.
One-line recall Variation arises through mutation and recombination; only heritable variation directly contributes to
evolutionary change.