

Class X

Mathematics

One-page chapter summaries
Large print • CBSE 2026-27 syllabus

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Written for Mathematics Standard (041). Mathematics Basic (241) has exactly the same 2026-27 syllabus and chapters; only the question paper is easier. Content from the rationalised NCERT textbook (Reprint 2026-27); questions from official CBSE Sample Question Papers.

Chapter 1: Real Numbers

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Big idea: Every composite number breaks into primes in exactly one way, and that unlocks HCF, LCM and irrationality proofs.

Key points

- **Fundamental Theorem of Arithmetic**: every composite number is a product of primes, unique apart from the order of the factors.
- **HCF** = product of the smallest power of each common prime factor.
- **LCM** = product of the greatest power of each prime factor involved.
- If a prime p divides a^2 , then p divides a (a a positive integer).
- $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$ are proved irrational by **contradiction**: assume a/b in lowest terms (co-prime), reach a common factor.
- Rational + irrational, and non-zero rational $\times$ irrational, are irrational (e.g. $2 + 3\sqrt{3}$, $5\sqrt{2}$).
- A number ends in 0 only if its prime factorisation has both 2 and 5 (so 6^n or 5^n never ends in 0).

Formulas, definitions & facts

- $\text{HCF}(a, b) \times \text{LCM}(a, b) = a \times b$ (two numbers only, not three)
- Largest number dividing x and y leaving remainders r_1 , $r_2 = \text{HCF}(x - r_1, y - r_2)$
- Things happening together again (bells, lights) $\rightarrow$ LCM; largest equal pieces / rooms / ruler $\rightarrow$ HCF

Exam focus: how to score

- **Irrationality proof (3 marks)**: write 'assume rational = a/b , $b \neq 0$ ', isolate the surd, state the contradiction, conclude. Each step earns marks.
- Word problems: decide HCF or LCM first and write why.
- Show the prime factorisation (factor tree or division) — answers alone lose marks.

★ Important questions from CBSE sample papers

- The greatest number which divides 134 and 188 leaving remainders 4 and 6 respectively is? (SQP 2026-27, 1 mark)
- Find the longest ruler that can exactly measure a hall $9.75 \text{ m} \times 6.75 \text{ m} \times 5.25 \text{ m}$. (SQP 2026-27, 2 marks)
- Given that $\sqrt{3}$ is irrational, prove that $2 + 3\sqrt{3}$ is irrational. (SQP 2026-27, 3 marks)

Remember: Together again $\rightarrow$ LCM. Cut into biggest equal parts $\rightarrow$ HCF.

Chapter 2: Polynomials

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Big idea: Zeroes are where the graph meets the x-axis, and they are tied to the coefficients.

Key points

- Degree 1, 2, 3 → **linear, quadratic, cubic** polynomial.
- **Zero** of $p(x)$: a value k with $p(k) = 0$.
- Geometrically, zeroes are the **x-coordinates where $y = p(x)$ cuts the x-axis**.
- Graph of a quadratic is a **parabola**: opens up if $a > 0$, down if $a < 0$.
- A quadratic has at most 2 zeroes; a cubic at most 3. Count zeroes from a graph by counting x-axis crossings.
- Zeroes reciprocal of each other → product = 1 → $a = c$.
- Equal zeroes → $b^2 = 4ac$, so a and c have the same sign.
- Form a quadratic from sum S and product P : $k(x^2 - Sx + P)$.

Formulas, definitions & facts

- **Quadratic $ax^2 + bx + c$: $\alpha + \beta = -b/a$, $\alpha\beta = c/a$**
- Cubic $ax^3 + bx^2 + cx + d$: $\alpha + \beta + \gamma = -b/a$, $\alpha\beta + \beta\gamma + \gamma\alpha = c/a$, $\alpha\beta\gamma = -d/a$
- $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$
- $1/\alpha + 1/\beta = (\alpha + \beta)/\alpha\beta$

Exam focus: how to score

- 'Find zeroes and verify the relationship' (3 marks): factorise by splitting the middle term, then check BOTH sum and product.
- For expressions in α , β , rewrite using $\alpha + \beta$ and $\alpha\beta$ first; never solve for α and β separately.
- Graph MCQs: count points where the curve touches/cuts the x-axis only.

★ Important questions from CBSE sample papers

- If α , β are zeroes of $2x^2 - 8x + 5$, find $(\alpha + 1/\beta)(\beta + 1/\alpha)$. (SQP 2026-27, 3 marks)
- Find the zeroes of $2x^2 - (1 + 2\sqrt{2})x + \sqrt{2}$ and verify the relationship between zeroes and coefficients. (SQP 2025-26, 3 marks)
- A-R: zeroes of $(2k - 1)x^2 + 4x - 3$ are reciprocals, so $k = -1$. Reason: if $a = c$, zeroes are reciprocal. (SQP 2026-27, 1 mark)

Remember: Sum is minus b by a, product is c by a.

Chapter 3: Pair of Linear Equations in Two Variables

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Big idea: Two lines can meet once, never, or everywhere: that decides the number of solutions.

Key points

- General form: $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$.
- **Graphical method:** plot both lines; the intersection point is the solution.
- Intersecting lines → unique solution → **consistent**.
- Coincident lines → infinitely many solutions → **dependent (consistent)**.
- Parallel lines → no solution → **inconsistent**.
- Algebraic methods in syllabus: **substitution** and **elimination**.
- Some equations (e.g. in $1/x$, $1/y$) can be changed into linear form by substitution.
- Word problems: ages, fractions, money, speed-of-boat, ticket sales.

Formulas, definitions & facts

- **$a_1/a_2 \neq b_1/b_2 \rightarrow$ unique solution (intersecting)**
- $a_1/a_2 = b_1/b_2 = c_1/c_2 \rightarrow$ infinitely many (coincident)
- $a_1/a_2 = b_1/b_2 \neq c_1/c_2 \rightarrow$ no solution (parallel)

Exam focus: how to score

- Word problems: define variables ('Let the cost of small bottle be ₹x'), form both equations, solve, answer in words.
- For 'find k' questions, write the ratio condition first, then solve.
- Check your answer in both original equations; a sign slip costs the final mark.

★ Important questions from CBSE sample papers

- Sanitizer case study: ₹10 small, ₹15 large; 1000 bottles sold for ₹12,750 in June. Prices +₹2; 2500 bottles for ₹34,250 in July. Form the equations and find bottles sold. (SQP 2026-27, 4 marks)
- Incomes of Aryan and Babban are in ratio 3:4, expenditures 5:7; each saves ₹15,000. Find their incomes. (SQP 2025-26, 3 marks)
- If $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are not parallel, then k has to be? (SQP 2025-26, 1 mark)

Remember: Ratios differ → meet once. All equal → same line. Last one differs → parallel.

Chapter 4: Quadratic Equations

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Big idea: $ax^2 + bx + c = 0$ is solved by factorising or by the formula; the discriminant tells you what roots to expect.

Key points

- Standard form $ax^2 + bx + c = 0$, with $a \neq 0$.
- A **root** α satisfies $a\alpha^2 + b\alpha + c = 0$. Roots of the equation = zeroes of the polynomial.
- **Factorisation**: split the middle term so the two parts multiply to ac and add to b .
- **Quadratic formula** works for every quadratic with real roots.
- **Discriminant** $D = b^2 - 4ac$ decides the nature of roots.
- Check 'is it quadratic?' by expanding both sides; x^2 terms may cancel.
- Word problems: area of strips/plots, speed-time, ages, consecutive numbers.
- Reject impossible roots (negative length, speed or age) and say why.

Formulas, definitions & facts

- $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- **$D > 0$: two distinct real roots; $D = 0$: two equal roots ($-b/2a$); $D < 0$: no real roots**
- Speed problems: time = distance / speed

Exam focus: how to score

- 5-mark word problem: set the variable, form the equation, simplify to standard form, solve, reject the invalid root, state the answer with units.
- 'Find k for equal roots' $\rightarrow$ set $b^2 - 4ac = 0$.
- Show the splitting step clearly; marking schemes give a mark for it.

★ Important questions from CBSE sample papers

- A park $50 \text{ m} \times 40 \text{ m}$ has a rectangular pool in the middle with a uniform grass strip around it of area 1184 m^2 . Find the pool's dimensions. (SQP 2026-27, 5 marks)
- A train travels 63 km at some speed, then 72 km at 6 km/h faster, taking 3 hours in all. Find the original speed. (SQP 2025-26, 5 marks)
- If $(1 - p)$ is a root of $x^2 + px + 1 - p = 0$, then its roots are? (SQP 2026-27, 1 mark)

Remember: D decides: positive two, zero one (repeated), negative none.

Chapter 5: Arithmetic Progressions

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Big idea: Add the same number d every time; two formulas give any term and any sum.

Key points

- **AP:** each term = previous term + fixed **common difference d** .
- General form: $a, a + d, a + 2d, a + 3d, \dots$
- Test for AP: $a_2 - a_1 = a_3 - a_2 = \dots$ (d can be positive, negative or zero).
- Use **a_n** for 'which term', 'nth term', 'is x a term?' (n must be a positive integer).
- Use **S_n** for totals: savings, rows of seats, logs in a pile.
- Middle term of an AP with odd n terms is the $((n + 1)/2)$ th term.
- n th term from the end = $l - (n - 1)d$.
- $a_n = S_n - S_{n-1}$.

Formulas, definitions & facts

- **$a_n = a + (n - 1)d$**
- **$S_n = n/2 [2a + (n - 1)d]$**
- $S_n = n/2 (a + l)$, l = last term
- If a, b, c are in AP: $b = (a + c)/2$ (arithmetic mean)

Exam focus: how to score

- Write a, d and n before substituting — each is worth a step mark.
- For 'sum of multiples of 4 and 5 between 1 and 400', first list the AP (20, 40, ..., 380).
- For 'sum of last 10 terms', use terms 51st to 60th or subtract S_{50} from S_{60} .

★ Important questions from CBSE sample papers

- The middle term of the AP 10, 7, 4, ..., -62 is? (SQP 2026-27, 1 mark)
- Find the sum of integers between 1 and 400 that are multiples of 4 as well as 5. (SQP 2026-27, 3 marks)
- A polygon's smallest exterior angle is 8° , each next one 4° more. Find the number of sides. (SQP 2026-27, 3 marks)
- The AP 8, 10, 12, ... has 60 terms. Find the sum of its last 10 terms. (SQP 2025-26, 2 marks)

Remember: Term: $a + (n-1)d$. Sum: $n/2 \times (\text{first} + \text{last})$.

Chapter 6: Triangles

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Big idea: Similar triangles have the same shape: equal angles and proportional sides.

Key points

- **Similar figures**: same shape, not necessarily same size. All congruent figures are similar, not vice versa.
- Two polygons with the same number of sides are similar if angles are equal AND sides are in the same ratio.
- **Basic Proportionality Theorem (Thales)**: a line parallel to one side divides the other two sides in the same ratio (PROOF in syllabus).
- **Converse of BPT**: a line dividing two sides in the same ratio is parallel to the third side (statement only).
- Similarity criteria: **AAA / AA, SSS, SAS** (statements only).
- Ratio of perimeters (and of medians, altitudes) of similar triangles = ratio of corresponding sides.
- Write similarity in matching order: $\triangle ABC \sim \triangle PQR$ means $A \leftrightarrow P, B \leftrightarrow Q, C \leftrightarrow R$.

Formulas, definitions & facts

- BPT: $DE \parallel BC \Rightarrow AD/DB = AE/EC$
- $\triangle ABC \sim \triangle DEF \Rightarrow AB/DE = BC/EF = CA/FD$
- Perimeter ratio = side ratio

Diagrams, maps & graphs to practise

- BPT proof figure: $\triangle ABC$ with $DE \parallel BC$, join BE and CD, draw $EN \perp AB$ and $DM \perp AC$

Exam focus: how to score

- **BPT proof is a near-certain 5-marker**: Given, To prove, Construction, Proof (area ratios), then apply it to the second part.
- Name the criterion (AA, SAS, SSS) with every similarity claim.
- Draw a neat labelled figure; it carries marks.

★ Important questions from CBSE sample papers

- Prove BPT. Hence, in trapezium PQRS with $PQ \parallel SR$ and $XY \parallel PQ$, show $PX/XS = QY/YR$. (SQP 2026-27, 5 marks)
- ABCD is a trapezium with $AB \parallel DC$; diagonals meet at O. Show $AO/BO = CO/DO$. (SQP 2026-27, 2 marks)
- Perimeters of two similar triangles are 56 cm and 70 cm. A side of the first is 14 cm; find the corresponding side of the second. (SQP 2026-27, 1 mark)

Remember: Parallel line $\rightarrow$ equal ratios. Two equal angles $\rightarrow$ similar.

Chapter 7: Coordinate Geometry

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Big idea: Points on a grid let you measure lengths and split segments using two formulas.

Key points

- **Distance formula** gives the length between two points; use it to test isosceles, equilateral, right triangles, squares, rhombi, collinearity.
- Distance from the origin: $\sqrt{x^2 + y^2}$.
- Distance of (x, y) from the y-axis = $|x|$; from the x-axis = $|y|$.
- **Section formula** (internal division only in syllabus) finds the point dividing AB in $m_1 : m_2$.
- A point on the **x-axis** is $(x, 0)$; on the **y-axis** is $(0, y)$.
- Ratio in which the x-axis divides AB: take $k : 1$ and set $y = 0$.
- Diagonals of a parallelogram bisect each other: midpoints are equal (find the 4th vertex).
- Equidistant point / perpendicular bisector: equate the two distances (square both sides).

Formulas, definitions & facts

- **$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$**
- **$P = ((m_1x_2 + m_2x_1)/(m_1 + m_2), (m_1y_2 + m_2y_1)/(m_1 + m_2))$**
- Midpoint = $((x_1 + x_2)/2, (y_1 + y_2)/2)$

Exam focus: how to score

- Write the formula first, then substitute; mark schemes award the formula step.
- For ratio questions, use $k : 1$ and give the final point of division too.
- Square both sides early to avoid square-root errors.

★ Important questions from CBSE sample papers

- In what ratio does the x-axis divide the segment joining $(-4, -6)$ and $(-1, 7)$? Find the point of division. (SQP 2026-27, 3 marks)
- PM is a median of ΔPQR with $P(5, -6)$, $Q(6, 4)$, $R(0, 0)$. Find PM. (SQP 2026-27, 1 mark)
- Which point lies on the perpendicular bisector of $A(-3, -4)$ and $B(3, 4)$? (SQP 2026-27, 1 mark)
- $P(2, 5)$, $Q(4, 4)$, $R(8, 3)$: find PR; is Q the midpoint of PR? Find a point on the x-axis equidistant from P and Q. (SQP 2025-26, 4 marks)

Remember: Distance: root of $(\Delta x^2 + \Delta y^2)$. Section: cross-multiply ratio with the far point.

Chapter 8: Introduction to Trigonometry

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Big idea: In a right triangle, ratios of sides depend only on the angle.

Key points

- For acute angle A in right $\triangle ABC$ (right angle at B): $\sin A = \text{opp/hyp}$, $\cos A = \text{adj/hyp}$, $\tan A = \text{opp/adj}$.
- **cosec, sec, cot** are reciprocals of $\sin$, $\cos$, $\tan$.
- Know one ratio $\rightarrow$ draw the triangle, find the third side by Pythagoras, get all ratios.
- $\sin A$ and $\cos A$ never exceed 1; $\sec A$ and $\text{cosec } A$ are always ≥ 1 .
- $\tan 90^\circ$ and $\sec 90^\circ$ are not defined; $\cot 0^\circ$ and $\text{cosec } 0^\circ$ are not defined.
- **Learn the standard table** for 0° , 30° , 45° , 60° , 90° .
- Prove identities by working on ONE side (usually the harder one) until it equals the other.

Formulas, definitions & facts

- $\sin$: 0, $1/2$, $1/\sqrt{2}$, $\sqrt{3}/2$, 1 (0° , 30° , 45° , 60° , 90°)
- $\cos$: 1, $\sqrt{3}/2$, $1/\sqrt{2}$, $1/2$, 0
- $\tan$: 0, $1/\sqrt{3}$, 1, $\sqrt{3}$, not defined
- $\tan A = \sin A / \cos A$; $\cot A = \cos A / \sin A$
- **$\sin^2 A + \cos^2 A = 1$**
- $\sec^2 A - \tan^2 A = 1$; $\text{cosec}^2 A - \cot^2 A = 1$

Exam focus: how to score

- Identity proofs (3 marks): convert to $\sin$ and $\cos$, take LCM, use $\sin^2 + \cos^2 = 1$. Show every line.
- 'Find A and B' questions: turn each value into an angle (e.g. $\tan(A+B) = \sqrt{3} \rightarrow A + B = 60^\circ$), then solve.
- Error-spotting questions: find the faulty step, fix it, and finish the answer.

★ Important questions from CBSE sample papers

- If $\tan \theta = 1/\sqrt{5}$, find $(\text{cosec}^2 \theta - \sec^2 \theta)/(\text{cosec}^2 \theta + \sec^2 \theta)$. (SQP 2026-27, 2 marks)
- Find the error in Jyoti's simplification of $\cos \theta/(1 - \sin \theta) + (1 - \sin \theta)/\cos \theta$, rectify it and get the correct answer. (SQP 2026-27, 3 marks)
- If $\sin(A + B) = 1$ and $\cos(A - B) = \sqrt{3}/2$, $0^\circ < A, B < 90^\circ$, find A and B. (SQP 2025-26, 2 marks)
- Prove $(\cos A - \sin A + 1)/(\cos A + \sin A - 1) = \text{cosec } A + \cot A$. (SQP 2025-26, 3 marks)

Remember: Some People Have Curly Brown Hair Through Proper Brushing: $\sin = P/H$, $\cos = B/H$, $\tan = P/B$.

Chapter 9: Some Applications of Trigonometry

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Big idea: Heights and distances you can't measure are found with tan, sin or cos in right triangles.

Key points

- **Line of sight:** line from the observer's eye to the object.
- **Angle of elevation:** angle between line of sight and horizontal when looking UP.
- **Angle of depression:** angle between line of sight and horizontal when looking DOWN.
- Angle of depression from A to B = angle of elevation from B to A (alternate angles).
- Syllabus limit: at most **two right triangles**; angles only 30° , 45° , 60° .
- tan is used most (height and base); use sin/cos when the slant length (string, ladder) is involved.
- Include the observer's height when the angle is measured from the eye.

Formulas, definitions & facts

- $\tan \theta = \text{height} / \text{horizontal distance}$
- $\sin \theta = \text{height} / \text{slant length (string, ladder, wire)}$
- $\tan 30^\circ = 1/\sqrt{3}$, $\tan 45^\circ = 1$, $\tan 60^\circ = \sqrt{3}$

Diagrams, maps & graphs to practise

- Tower/lighthouse with two ships on the same side (angles of depression 45° and 30°)
- Observer of height h looking at a monument: horizontal line from the eye, not the ground

Exam focus: how to score

- Always draw a labelled diagram first — it carries marks in the 5-mark question.
- Write one equation per triangle, then eliminate the common unknown.
- State the final answer with units (m).

★ Important questions from CBSE sample papers

- Ships 200 m apart on the same side of a lighthouse are seen at angles of depression 45° and 30° . Find the lighthouse's height. (SQP 2026-27, 5 marks)
- Manish sees a kite 200 m away at 30° ; Mahesh, on a 50 m building opposite, sees it at 45° . Find the distance between kite and Mahesh. (SQP 2026-27, 5 marks)
- A kite string is 52 m and $\tan \theta = 12/5$. Find the kite's height. (SQP 2026-27, 1 mark)
- Shreya (eye height 1 m) views the 42 m India Gate: find the angle of elevation from 41 m away, and her distance when the angle is 60° . (SQP 2025-26, case study)

Remember: Draw first. Elevation up, depression down — and they are equal across parallel lines.

Chapter 10: Circles

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Big idea: A tangent touches a circle at exactly one point and is perpendicular to the radius there.

Key points

- **Secant:** line meeting a circle at two points. **Tangent:** line meeting it at exactly one point (point of contact).
- No tangent passes through a point inside the circle; exactly one through a point on it; exactly two from a point outside.
- **Theorem 10.1 (PROOF):** the tangent at any point is perpendicular to the radius through the point of contact.
- **Theorem 10.2 (PROOF):** lengths of tangents from an external point are equal.
- Tangents from an external point are equally inclined to the line joining the point to the centre.
- Angle between two tangents + angle subtended by the contact points at the centre = 180° .
- Quadrilateral circumscribing a circle: $AB + CD = AD + BC$.

Formulas, definitions & facts

- Tangent length from P: $PA = \sqrt{(OP^2 - r^2)}$
- $\angle APB + \angle AOB = 180^\circ$
- $\angle OAP = 90^\circ$

Diagrams, maps & graphs to practise

- Circle with two tangents PA, PB from external point P, radii OA, OB and line OP

Exam focus: how to score

- Both theorem proofs are in the syllabus: give Given, To prove, Construction, Proof with reasons.
- In 'prove it's a rhombus' type questions, label equal tangent pairs and add them up.
- Write the reason for each step (e.g. 'tangents from an external point are equal').

★ Important questions from CBSE sample papers

- Prove that the parallelogram circumscribing a circle is a rhombus. (SQP 2026-27, 3 marks)
- Garden case study: radius 9 m, $OP = 18$ m. Find $\angle OAP$, tangent PA and $\angle AOB$. (SQP 2026-27, 4 marks)
- XY and X'Y' are parallel tangents; tangent AB touches at C and meets them at A and B. Prove $\angle AOB = 90^\circ$. (SQP 2025-26, 3 marks)

Remember: Radius meets tangent at 90° . Two tangents from one point are twins.

Chapter 11: Areas Related to Circles

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Big idea: A sector is a slice of the circle; a segment is the sector minus its triangle.

Key points

- **Sector:** region between two radii and an arc. Minor sector uses angle θ ; major sector uses $360^\circ - \theta$.
- **Segment:** region between a chord and its arc.
- Area of segment = area of sector – area of triangle.
- Syllabus limit: segment questions only for central angle **60° , 90° or 120°** .
- $60^\circ \rightarrow$ equilateral triangle (area $\frac{\sqrt{3}}{4} r^2$); $90^\circ \rightarrow$ right triangle (area $\frac{r^2}{2}$); $120^\circ \rightarrow$ area $(\frac{\sqrt{3}}{4}) r^2$.
- Distance covered in one revolution of a wheel = circumference = $2\pi r$.
- Take $\pi = \frac{22}{7}$ unless told otherwise (SQP instruction).
- Grazing, clock-hand and wiper problems are sector problems.

Formulas, definitions & facts

- **Arc length = $(\theta/360^\circ) \times 2\pi r$**
- **Area of sector = $(\theta/360^\circ) \times \pi r^2$**
- Area of sector = $\frac{1}{2} \times \text{arc length} \times r$
- Area of segment = $(\theta/360^\circ)\pi r^2 - \text{area of triangle}$
- Circumference = $2\pi r$; area = πr^2

Exam focus: how to score

- Write the formula with θ before substituting; keep π as $\frac{22}{7}$ or 3.14 as told.
- For segments, show the triangle area separately — it is its own step mark.
- Units: cm for length, cm^2 for area.

★ Important questions from CBSE sample papers

- Find the area of a sector of a circle of diameter 28 cm if the arc length is 22 cm. (SQP 2026-27, 2 marks)
- An arc of length 6π cm bounds a sector of area $24\pi \text{ cm}^2$. Find the radius. (SQP 2026-27, 1 mark)
- A car wheel has diameter 21 cm. Find the complete revolutions it makes in 66 km. (SQP 2026-27, 1 mark)

Remember: Slice of pizza = sector; crust edge cut off by a straight line = segment.

Chapter 12: Surface Areas and Volumes

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Big idea: Combine two basic solids: add their volumes, but count only the surfaces you can see.

Key points

- Syllabus: combinations of ANY TWO of cube, cuboid, sphere, hemisphere, right circular cylinder, cone.
- **Total surface area of a combination** = sum of visible curved/flat surfaces only; hidden joined faces are left out.
- **Volume of a combination** = sum (or difference, if hollowed) of the individual volumes.
- Tent = cylinder + cone: canvas = CSA of cylinder + CSA of cone (no base).
- Toy = hemisphere + cone; capsule = cylinder + two hemispheres.
- Hollowing out a cavity: remove its volume, but ADD the inner surface it creates.
- Two cubes of side a joined end to end form a cuboid $2a \times a \times a$.
- Slant height $l = \sqrt{r^2 + h^2}$.

Formulas, definitions & facts

- Cylinder: CSA $2\pi rh$, volume $\pi r^2 h$
- **Cone: CSA πrl , volume $\frac{1}{3}\pi r^2 h$**
- Sphere: SA $4\pi r^2$, volume $(\frac{4}{3})\pi r^3$
- **Hemisphere: CSA $2\pi r^2$, TSA $3\pi r^2$, volume $(\frac{2}{3})\pi r^3$**
- Cuboid: TSA $2(lb + bh + hl)$, volume lbh ; Cube: $6a^2$, a^3

Exam focus: how to score

- Draw and split the solid; list each part's surface or volume before adding.
- Read carefully: 'canvas', 'painting', 'cost' mean surface area; 'wood used', 'capacity' mean volume.
- Convert units first ($\text{cm}^3 \leftrightarrow \text{litres}$: $1000 \text{ cm}^3 = 1 \text{ L}$).

★ Important questions from CBSE sample papers

- Tent: cylinder (h 3 m, r 14 m) with conical top, total height 13.5 m. Find canvas needed with 26 m^2 extra for wastage, and its cost at ₹250 per m^2 . (SQP 2026-27, 5 marks)
- Wooden toy: hemisphere (r 3.5 cm) surmounted by a cone; volume $166\frac{5}{6} \text{ cm}^3$. Find the cone's height and cost of painting the hemisphere at ₹15 per cm^2 . (SQP 2026-27, 5 marks)
- Two cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the cuboid. (SQP 2026-27, 1 mark)

Remember: Volumes add up; surfaces add only what you can touch.

Chapter 13: Statistics

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Big idea: Mean, median and mode of grouped data come from class marks, cumulative frequencies and the modal class.

Key points

- **Class mark** $x_i = (\text{lower limit} + \text{upper limit})/2$; frequency is assumed centred at it.
- **Mean**: direct, assumed-mean or step-deviation method — all give the same answer.
- **Modal class**: class with the highest frequency.
- **Median class**: class whose cumulative frequency first reaches or passes $n/2$.
- **Cumulative frequency (cf)**: running total of frequencies up to that class.
- Make classes continuous before using formulas; convert 'less than' tables to class-frequency form.
- Bimodal data is not asked in the syllabus.
- Combined mean $= (n_1\bar{x}_1 + n_2\bar{x}_2)/(n_1 + n_2)$.

Formulas, definitions & facts

- Direct: $\bar{x} = \sum f_i x_i / \sum f_i$
- Assumed mean: $\bar{x} = a + \sum f_i d_i / \sum f_i$, $d_i = x_i - a$
- Step deviation: $\bar{x} = a + (\sum f_i u_i / \sum f_i) \times h$, $u_i = (x_i - a)/h$
- **Mode** $= l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$
- **Median** $= l + [(n/2 - cf)/f] \times h$
- $3 \text{ Median} = \text{Mode} + 2 \text{ Mean}$ (empirical)

Exam focus: how to score

- Draw a neat table with x_i , f_i , $f_i x_i$ (or d_i , u_i) and cf columns — table work earns marks.
- Write l , f , f_0 , f_1 , f_2 , cf, h separately before substituting.
- Case studies often ask modal class and median class: answer with the class interval, not a number.

★ Important questions from CBSE sample papers

- Marks out of 50: 0–10: 3, 10–20: 6, 20–30: 12, 30–40: 15, 40–50: 14. Find modal class, median class, and the mean or mode. (SQP 2026-27, 4 marks)
- Mean and median of a data set are 35.5 and 32. Find the mode. (SQP 2026-27, 1 mark)
- Combined mean age is 35; men 38, women 30. Find the percentage of women. (SQP 2026-27, 1 mark)
- If the mode of the given distribution is 55, find x and hence the mean. (SQP 2025-26, 5 marks)

Remember: Mode: highest f. Median: first cf past $n/2$. Mean: $\sum fx$ over $\sum f$.

Chapter 14: Probability

Class X • Mathematics • CBSE 2026-27

Big idea: Probability = favourable outcomes ÷ all equally likely outcomes, always between 0 and 1.

Key points

- **$P(E)$ = number of favourable outcomes / total number of outcomes** (equally likely outcomes).
- Sure event: $P = 1$. Impossible event: $P = 0$. Always $0 \leq P(E) \leq 1$.
- **Elementary event**: only one outcome. Sum of probabilities of all elementary events = 1.
- **Complementary events**: $P(E) + P(\text{not } E) = 1$.
- Two dice: 36 outcomes; write the pairs as a grid. Three coins: 8 outcomes.
- Deck: 52 cards, 4 suits of 13; 12 face cards (J, Q, K); 26 red, 26 black.
- If cards are removed, reduce the total first.
- Count carefully: 'between', 'from 4 to 99', 'perfect square or cube' (don't double count).

Formulas, definitions & facts

- $P(E)$ = favourable / total
- $P(\text{not } E) = 1 - P(E)$
- Two dice sums: 7 occurs 6 times; 2 and 12 once each

Exam focus: how to score

- List the sample space and the favourable outcomes explicitly; marking schemes reward the listing.
- Give the answer as a simplified fraction.
- In 'who is more likely' questions, compute both probabilities and compare with a clear statement.

★ Important questions from CBSE sample papers

- Two dice are thrown. Find the probability that the product of the numbers is a prime. (SQP 2026-27, 2 marks)
- T-shirts numbered 4 to 99: find the probability of a perfect square or a perfect cube. (SQP 2026-27, 1 mark)
- 2 diamonds and 4 spades are missing from a 52-card pack. Find $P(\text{heart})$. (SQP 2026-27, 1 mark)
- Vidhi and Unnati each flip a coin three times; two heads in a row vs head followed by tail. Who is more likely to drive? (SQP 2025-26, 3 marks)

Remember: What you want ÷ everything possible. Not-E = 1 minus E.

Class X

Science

One-page chapter summaries
Large print • CBSE 2026-27 syllabus

1. Chemical Reactions and Equations — page 2
2. Acids, Bases and Salts — page 3
3. Metals and Non-metals — page 4
4. Carbon and its Compounds — page 5
5. Life Processes — page 6
6. Control and Coordination — page 7
7. How do Organisms Reproduce? — page 8
8. Heredity — page 9
9. Light - Reflection and Refraction — page 10
10. The Human Eye and the Colourful World — page 11
11. Electricity — page 12
12. Magnetic Effects of Electric Current — page 13
13. Our Environment — page 14

Not included: Periodic Classification of Elements, Evolution, and electric motor / electromagnetic induction / generator. CBSE's 2026-27 curriculum says these are assessed only in school (formative) and not in the board exam. Questions marked SQP are from the official CBSE Sample Question Paper 2026-27.

Chapter 1: Chemical Reactions and Equations

Class X • Science • CBSE 2026-27

Big idea: Atoms rearrange into new substances; a balanced equation shows mass is conserved.

Key points

- Signs of a reaction: change of state, colour or temperature; gas given off; precipitate formed.
- **Balanced equation:** equal atoms of each element on both sides — **law of conservation of mass**.
- **Combination:** $A + B \rightarrow AB$, e.g. $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{heat}$.
- **Decomposition:** one substance breaks down by heat, electricity or light.
- **Displacement:** $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$ (blue $\rightarrow$ light green).
- **Double displacement:** ions swap; $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4\downarrow$ (white precipitate) $+ 2\text{NaCl}$.
- **Oxidation** = gain of O / loss of H; **reduction** = loss of O / gain of H. Together = **redox**.
- **Exothermic** gives out heat (respiration, burning); **endothermic** takes in heat.

Key reactions

- $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$ (dazzling white flame)
- $2\text{FeSO}_4 \xrightarrow{\text{heat}} \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$ (green $\rightarrow$ brown)
- $\text{CaCO}_3 \xrightarrow{\text{heat}} \text{CaO} + \text{CO}_2$
- $2\text{H}_2\text{O} \xrightarrow{\text{electricity}} 2\text{H}_2 + \text{O}_2$ (H_2 volume double)
- $2\text{AgCl} \xrightarrow{\text{sunlight}} 2\text{Ag} + \text{Cl}_2$ (photography)
- $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$ (CuO reduced, H_2 oxidised)

Exam focus: how to score

- **Balancing equations** and naming reaction types — every year.
- In redox, name what is oxidised and what is reduced.
- Write observations (colour, gas, precipitate) — they carry marks.

★ Important questions from CBSE sample papers

- Correct the errors: $\text{MgCl}_2 + \text{AgNO}_3 \rightarrow \text{AgCl}_2 + \text{MgNO}_3$ and $\text{Al} + \text{H}_2\text{SO}_4 \rightarrow \text{Al}_2\text{SO}_4 + \text{H}_2\text{O}$. (SQP 2026-27, 5 marks)
- Iron filings in MgSO_4 solution: will it turn green? Aluminium in dilute H_2SO_4 : will it fizz? Give reasons. (SQP 2026-27, 5 marks)

Remember: Balance with numbers in front — never change a formula.

Chapter 2: Acids, Bases and Salts

Class X • Science • CBSE 2026-27

Big idea: Acids give H^+ ions, bases give OH^- ions; together they neutralise to salt + water.

Key points

- **Acids:** sour, blue litmus $\rightarrow$ red. **Bases:** bitter, soapy, red litmus $\rightarrow$ blue. Soluble bases = **alkalis**.
- **Olfactory indicators** change smell: onion, vanilla, clove oil. Phenolphthalein turns pink in base.
- Acid + metal $\rightarrow$ salt + H_2 (pop test). Acid + carbonate $\rightarrow$ salt + CO_2 + water (lime water milky).
- Acid + base $\rightarrow$ salt + water (**neutralisation**). Metal oxides basic; non-metal oxides acidic.
- **Add acid to water, never water to acid** — dilution gives out heat.
- **pH** 0–14: below 7 acidic, 7 neutral, above 7 basic.
- Body works at pH 7.0–7.8; **tooth decay below pH 5.5**; antacids cure acidity; acid rain below 5.6.
- **Water of crystallisation:** blue $CuSO_4 \cdot 5H_2O$ turns white on heating.

Important chemicals

- **Chlor-alkali:** $2NaCl + 2H_2O \rightarrow 2NaOH + Cl_2$ (anode) + H_2 (cathode)
- Bleaching powder: $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$
- Baking soda $NaHCO_3$: $2NaHCO_3 \xrightarrow{\text{heat}} Na_2CO_3 + H_2O + CO_2$
- Washing soda $Na_2CO_3 \cdot 10H_2O$ — removes permanent hardness
- Plaster of Paris $CaSO_4 \cdot \frac{1}{2}H_2O$: gypsum heated at 373 K; sets back to gypsum with water
- Excess CO_2 in lime water $\rightarrow$ soluble $Ca(HCO_3)_2$, milky appearance disappears

Exam focus: how to score

- Salt: formula + preparation equation + one use — common 3-marker.
- Arrange solutions by pH; gas tests with equations.

★ Important questions from CBSE sample papers

- Chlor-alkali: which match? H_2 at cathode – fuel; Cl_2 at anode – margarine; $NaOH$ near cathode – soap. (SQP 2026-27, 1 mark)
- Which contain water of crystallisation: Plaster of Paris, washing soda, baking soda, gypsum? (SQP 2026-27, 1 mark)
- Why does milky appearance disappear when excess CO_2 passes through lime water? (SQP 2026-27, 3 marks)

Remember: Below 7 = sour side, above 7 = soapy side.

Chapter 3: Metals and Non-metals

Class X • Science • CBSE 2026-27

Big idea: Metals lose electrons, non-metals gain them — this decides properties, reactivity and extraction.

Key points

- Metals: lustrous, malleable, ductile, sonorous, good conductors; **silver and copper conduct best.**
- Exceptions: mercury liquid; Na, K soft; iodine lustrous; graphite conducts; diamond hardest.
- **Amphoteric** oxides (Al_2O_3 , ZnO) react with acids and bases.
- Water: Na, K violent (kept in kerosene); Mg — hot water; Al, Fe, Zn — steam only; Cu, Ag, Au — none.
- **Reactivity series:** $\text{K} > \text{Na} > \text{Ca} > \text{Mg} > \text{Al} > \text{Zn} > \text{Fe} > \text{Pb} > \text{H} > \text{Cu} > \text{Hg} > \text{Ag} > \text{Au}$.
- **Ionic compounds** (electron transfer): high melting points, dissolve in water, conduct when molten or dissolved.
- Rust needs air + water. Prevent by painting, oiling, **galvanising (zinc coat)**, alloying (stainless steel).

Extracting metals

- Ore → enrichment → reduction → refining
- **Roasting** (sulphide, excess air): $2\text{ZnS} + 3\text{O}_2 \rightarrow 2\text{ZnO} + 2\text{SO}_2$
- **Calcination** (carbonate, limited air): $\text{ZnCO}_3 \rightarrow \text{ZnO} + \text{CO}_2$; $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$
- **Thermit:** $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow 2\text{Fe} + \text{Al}_2\text{O}_3 + \text{heat}$ (railway tracks)
- Na, Mg, Al: electrolysis of molten compounds
- Refining Cu: impure Cu anode, pure Cu cathode, CuSO_4 electrolyte

Exam focus: how to score

- **Electron-dot formation of NaCl, MgCl_2** — frequent 3-marker.
- Roasting vs calcination with equations.
- Displacement activity: order of reactivity.

★ Important questions from CBSE sample papers

- Rods of Al, Ag, Cu, Fe, Zn heated at one point; candles fall at different times. Best conductor? Effect of 20% longer rods? (SQP 2026-27, 4 marks)
- Why do aluminium wires not corrode easily? (SQP 2026-27, 1 mark)
- Why does an iron bridge near the sea rust faster than one in dry hills? (SQP 2026-27, 3 marks)

Remember: Please Send Cats, Monkeys And Zebras In Large Hired Cages Made of Silver and Gold.

Chapter 4: Carbon and its Compounds

Class X • Science • CBSE 2026-27

Big idea: Carbon shares electrons; tetravalency and catenation give millions of compounds.

Key points

- **Covalent bond** = shared electron pairs; covalent compounds have low melting points, poor conductors.
- Carbon (2, 4) **shares** 4 electrons — it is **tetravalent**.
- **Catenation**: carbon links to carbon in chains, branches and rings.
- **Saturated** (single bonds) burn with blue flame; **unsaturated** (double/triple) give sooty flame.
- **Isomers**: same formula, different structure (butane, isobutane).
- **Homologous series**: members differ by $-\text{CH}_2-$; similar chemical properties.
- Name endings: -ol alcohol, -al aldehyde, -one ketone, -oic acid; chloro-, bromo-.
- **Soap** forms micelles; makes scum in hard water. Detergents work in hard water.

Key reactions

- Combustion: $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O} + \text{heat}$
- Oxidation: ethanol $\rightarrow$ (alk. KMnO_4) ethanoic acid
- **Hydrogenation**: oil + $\text{H}_2 \rightarrow$ (Ni) fat
- Substitution: $\text{CH}_4 + \text{Cl}_2 \rightarrow$ (sunlight) $\text{CH}_3\text{Cl} + \text{HCl}$
- Ethanol $\rightarrow$ (conc. H_2SO_4 , 443 K) ethene + water
- **Esterification**: acid + alcohol $\rightarrow$ ester (sweet smell) + water
- $\text{CH}_3\text{COOH} + \text{NaHCO}_3 \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O} + \text{CO}_2$

Exam focus: how to score

- **Electron-dot structures** (CH_4 , ethene, CO_2 , ethanol).
- Next homologue; reactions of ethanol and ethanoic acid.
- Micelle diagram; soap vs detergent.

★ Important questions from CBSE sample papers

- Why does carbon form millions of compounds but silicon only a few? (SQP 2026-27, 2 marks)
- $\text{C}_2\text{H}_6\text{O}$ is blended with petrol. Draw its electron-dot structure, give the next homologue and its reaction with acetic acid. (SQP 2026-27, 3 marks)

Remember: Carbon is the great sharer: 4 bonds, endless chains.

Chapter 5: Life Processes

Class X • Science • CBSE 2026-27

Big idea: Nutrition, respiration, transport and excretion keep every organism alive.

Key points

- **Photosynthesis:** light absorbed → water splits → CO₂ reduced to sugar. Gases move through **stomata**.
- Stomach: HCl, pepsin, mucus. Small intestine: **bile emulsifies fats**; trypsin, lipase; **villi** absorb food.
- **Respiration:** glucose → pyruvate (cytoplasm) → CO₂ + water in mitochondria. Energy stored as **ATP**.
- No oxygen: yeast → ethanol + CO₂; muscles → lactic acid (cramps).
- **Alveoli** give a huge surface for gas exchange. Aquatic animals breathe faster — less dissolved O₂.
- 4-chambered heart, **double circulation**: keeps oxygenated blood separate — warm-blooded birds and mammals. Fish: 2 chambers.
- Plants: **xylem** carries water; **phloem** carries food (uses ATP).
- **Nephrons** filter blood; glucose, salts, water reabsorbed; urine stored in bladder.

Key equation

- $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow{\text{(chlorophyll, sunlight)}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$

Diagrams to practise

- Human heart; nephron
- Digestive system; stomata

Exam focus: how to score

- **Labelled diagrams** carry sure marks.
- Compare aerobic vs anaerobic; xylem vs phloem; arteries vs veins.

★ Important questions from CBSE sample papers

- Bile duct blocked — how is digestion affected? Why does intestine length differ with diet? (SQP 2026-27, 2 marks)
- Which heart do birds and mammals have, and how does it help keep body temperature? (SQP 2026-27, 5 marks)
- Which pair is reabsorbed in the kidneys: glucose and salts, glucose and starch, glycogen and salts, or glycogen and starch? (SQP 2026-27, 1 mark)

Remember: Eat, burn, carry, clean — the four jobs of life.

Chapter 6: Control and Coordination

Class X • Science • CBSE 2026-27

Big idea: Animals use nerves and hormones; plants use hormones and growth movements.

Key points

- **Neuron:** dendrite → cell body → axon; signal crosses the **synapse** as a chemical.
- **Reflex action:** quick, automatic. **Reflex arc:** receptor → sensory neuron → spinal cord → motor neuron → muscle.
- **Fore-brain:** thinking, voluntary acts. **Medulla:** involuntary acts (BP, salivation, vomiting). **Cerebellum:** balance.
- Muscle cells have special proteins that change shape when an impulse arrives.
- **Touch-me-not** leaves fold as cells lose water — not growth.
- **Tropisms:** shoot to light, root to gravity and water, pollen tube to ovule.
- Plant hormones: **auxin** (bends shoot to light), gibberellins (stem growth), cytokinins (cell division), abscisic acid (inhibits growth).
- Hormone levels are set by **feedback** (high blood sugar → more insulin).

Animal hormones

- Adrenaline (adrenal) — fight or flight
- Thyroxine (thyroid) — metabolism; needs iodine; lack → goitre
- Growth hormone (pituitary) — lack → dwarfism
- Insulin (pancreas) — blood sugar; lack → diabetes
- Testosterone / oestrogen — puberty changes

Exam focus: how to score

- Draw neuron, reflex arc or brain.
- Match hormone – gland – function.

★ Important questions from CBSE sample papers

- Which brain parts control actions without thinking? Name them and give two examples. (SQP 2026-27, 2 marks)
- How do muscles move at the cellular level on receiving messages from the brain? (SQP 2026-27, 3 marks)

Remember: Nerves are fast phone calls; hormones are slow letters.

Chapter 7: How do Organisms Reproduce?

Class X • Science • CBSE 2026-27

Big idea: Reproduction copies DNA; small copying variations help a species survive change.

Key points

- DNA copying is never perfect → **variation**, useful for survival.
- Asexual: **fission** (Amoeba, Plasmodium), **fragmentation** (Spirogyra), **regeneration** (Planaria), **budding** (Hydra, yeast), **spores** (Rhizopus).
- **Vegetative propagation**: Bryophyllum leaf, sugarcane, rose, banana.
- Flower: **stamen** (anther → pollen) and **pistil** (stigma, style, ovary).
- Pollination → pollen tube → **fertilisation** → zygote. **Ovule → seed, ovary → fruit.**
- Male: testes make sperm and testosterone → vas deferens → urethra.
- Female: egg fertilised in **oviduct**; embryo implants in uterus; **placenta** gives food and O₂.
- Contraception: condoms (also stop HIV-AIDS), pills, copper-T, vasectomy, tubectomy.

Diagrams to practise

- LS of flower; pollen tube
- Human reproductive systems

Exam focus: how to score

- **Labelled diagrams** of flower and reproductive systems.
- Asexual vs sexual; self vs cross pollination.
- Functions of testes, oviduct, placenta; ways to prevent STDs.

★ Important questions from CBSE sample papers

- What changes take place in the uterus after implantation? (SQP 2026-27, 2 marks)
- What common event do vasectomy and tubectomy prevent? (SQP 2026-27, 1 mark)
- Anthers of a mustard bud are removed and the bud bagged. Will seeds form? (SQP 2026-27, 1 mark)

Remember: Ovule becomes seed, ovary becomes fruit.

Chapter 8: Heredity

Class X • Science • CBSE 2026-27

Big idea: Traits pass to children through pairs of genes; Mendel's peas showed the rules.

Key points

- Sexual reproduction gives more variation than asexual.
- Each trait has two gene copies, one from each parent.
- Mendel used pea: tall/short, round/wrinkled, violet/white.
- **Dominant** shows in F1; **recessive** shows only as tt.
- $TT \times tt \rightarrow F1$ all Tt (tall); $F2 = 3 \text{ tall} : 1 \text{ short}$.
- Dihybrid F2 shows new combinations $\rightarrow$ traits **inherited independently**.
- A **gene** is DNA that makes a protein, e.g. an enzyme for growth hormone.
- Humans: women XX, men XY. **Father's sperm decides the child's sex.**

Ratios

- Monohybrid F2: phenotype 3 : 1, genotype 1 : 2 : 1
- Dihybrid F2: 9 : 3 : 3 : 1
- $XX \times XY \rightarrow 50\% \text{ girls}, 50\% \text{ boys}$

Diagrams to practise

- Punnett squares; sex determination chart

Exam focus: how to score

- Show crosses in a **Punnett square**.
- Why F1 shows one trait; why boy/girl chance is 50 : 50.

★ Important questions from CBSE sample papers

- White (vv) $\times$ violet (VV) peas: % violet in F1 and F2? $VVTT \times vvtt$: % tall white in F2? (SQP 2026-27, 4 marks)
- Apple male gamete has 17 chromosomes. How many in the female gamete and adult cells? (SQP 2026-27, 1 mark)
- How is equal genetic contribution of both parents ensured? (NCERT Exercises, Q4)

Remember: One from Mum, one from Dad: 3 : 1 and 9 : 3 : 3 : 1.

Chapter 9: Light - Reflection and Refraction

Class X • Science • CBSE 2026-27

Big idea: Mirrors reflect and lenses refract light to form images; formula + signs solve every numerical.

Key points

- Reflection: angle i = angle r ; rays and normal in one plane.
- Concave mirror converges, convex diverges. **$R = 2f$** .
- Concave: real, inverted images, except object inside $F \rightarrow$ virtual, erect, enlarged.
Convex: always virtual, erect, small.
- Uses: concave — torches, shaving mirrors; convex — **rear-view mirrors** (wide view).
- **Sign convention**: from pole; along incident light +; u always –.
- Refraction: light bends as speed changes; bends towards normal entering denser medium.
- **Snell's law: $\sin i / \sin r = \text{constant}$** (refractive index).
- Convex lens converges (f +); concave lens diverges (f –).

Formulas

- Mirror: $1/v + 1/u = 1/f$; $m = -v/u$
- Lens: $1/v - 1/u = 1/f$; $m = v/u$
- $m - \rightarrow$ real, inverted; $m + \rightarrow$ virtual, erect
- $n = c / v$; $n_{21} = v_1 / v_2$
- Power $P = 1/f$ (metres), unit dioptre

Diagrams to practise

- Ray diagrams: concave mirror, convex lens
- Glass slab refraction

Exam focus: how to score

- **Numericals with signs**; state image nature.
- Ray diagrams need arrows and labels.

★ Important questions from CBSE sample papers

- A lens (concave, in the figure) forms an image $1/3$ the size of an object placed 24 cm away. Find the image distance and focal length. (SQP 2026-27, 3 marks)
- State Snell's law; define refractive index. (SQP 2026-27, 2 marks)
- A: A coin in water looks less deep. R: Light bends away from normal, water to air. (SQP 2026-27, 1 mark)

Remember: Mirror: v PLUS u . Lens: v MINUS u .

Chapter 10: The Human Eye and the Colourful World

Class X • Science • CBSE 2026-27

Big idea: The eye lens adjusts its focus; prisms, raindrops and particles split and scatter white light.

Key points

- **Cornea** bends most light; **iris** sets pupil size; **retina** sends signals via optic nerve.
- **Accommodation**: ciliary muscles change lens focal length. Near point 25 cm, far point infinity.
- **Myopia**: can't see far; image before retina → **concave lens**.
- **Hypermetropia**: can't see near; image behind retina → **convex lens**.
- **Presbyopia**: ageing; bi-focal lenses. **Cataract**: cloudy lens; surgery.
- **Dispersion**: white light → VIBGYOR; **red bends least, violet most**.
- **Rainbow**: raindrops refract, disperse and internally reflect; opposite the Sun.
- **Blue sky**: air molecules scatter blue most. Tyndall effect: sunbeam in misty forest.

Key facts

- Danger lights are red — scattered least
- No atmosphere → sky looks dark in space

Diagrams to practise

- Eye defects and correction
- Prism and dispersion

Exam focus: how to score

- Defect + correction diagrams (3–5 marks).
- Explain blue sky, red signals, rainbow.

★ Important questions from CBSE sample papers

- What is accommodation? Near point of a normal eye? Lens for not seeing far objects — draw how it helps. (SQP 2026-27, 5 marks)
- What is dispersion? Which colour deviates least? Why is the sky dark for an astronaut? (SQP 2026-27, 5 marks)

Remember: Myopia - Minus lens; Hypermetropia - Plus lens.

Chapter 11: Electricity

Class X • Science • CBSE 2026-27

Big idea: Potential difference drives current; resistance controls it ($V = IR$).

Key points

- **Current:** flow of charge, ampere; ammeter in **series**.
- **Potential difference:** volt; voltmeter in **parallel**.
- **Ohm's law:** $V \propto I$ at constant temperature; straight V-I graph.
- R increases with length, decreases with thickness; depends on material and temperature.
- **Resistivity** depends only on material and temperature; nichrome high $\rightarrow$ heaters.
- **Series:** same current. **Parallel:** same voltage; total R less than smallest.
- Homes use **parallel wiring**: full voltage, separate switching.
- **Fuse:** low melting wire in series; melts on high current. Bulb filament: tungsten.

Formulas

- $I = Q/t$; $V = W/Q$; **$V = IR$**
- $R = \rho l / A$
- $R_s = R_1 + R_2 + \dots$; $1/R_p = 1/R_1 + 1/R_2 + \dots$
- $H = I^2 R t$
- $P = VI = I^2 R = V^2/R$
- $1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$

Exam focus: how to score

- Resistor-combination numericals — every paper.
- Write formula and units at each step.

★ Important questions from CBSE sample papers

- A 1000 W appliance runs at 250 V. Find the current. (SQP 2026-27, 1 mark)
- State Joule's law of heating. Effect on heat if R is doubled? (SQP 2026-27, 2 marks)
- 15 V battery with 2 Ω , 3 Ω , 5 Ω in series: total R, current, voltage across 3 Ω . (SQP 2026-27, 3 marks)

Remember: $V = IR$ — cover the one you want.

Chapter 12: Magnetic Effects of Electric Current

Class X • Science • CBSE 2026-27

Big idea: Current makes a magnetic field; a current in a field feels a force.

Key points

- A current deflects a compass needle — electricity and magnetism are linked.
- Field lines: N to S outside; closed curves; **never cross**; crowded = strong.
- Straight wire: circular field lines; weaker farther from the wire.
- **Right-hand thumb rule**: thumb = current, curled fingers = field.
- **Solenoid**: uniform field inside, like a bar magnet; soft iron core → electromagnet.
- **Fleming's left-hand rule**: First finger = Field, second finger = Current, thumb = Motion (force).
- Home wiring: live (red), neutral (black), **earth (green)** stops shocks; fuse guards against overload and short-circuit.

Key facts

- AC reverses direction; India 220 V, 50 Hz
- AC can travel far with little energy loss
- Stronger solenoid: more current, more turns, iron core

Diagrams to practise

- Field lines: bar magnet, wire, solenoid

Exam focus: how to score

- Draw field lines with arrows.
- Apply thumb rule and Fleming's rule.

★ Important questions from CBSE sample papers

- State the right-hand thumb rule. How does the field change with distance? (SQP 2026-27, 3 marks)
- A door lock uses a solenoid to pull an iron bolt. Why an iron core? Effect of current 1 A → 2 A? (SQP 2026-27, 4 marks)

Remember: Right hand → field. Left hand → force.

Chapter 13: Our Environment

Class X • Science • CBSE 2026-27

Big idea: Energy flows one way through food chains; our waste can harm ecosystems and the ozone layer.

Key points

- **Ecosystem** = living things + non-living factors (soil, water, temperature).
- **Producers** make food; **consumers** eat; **decomposers** recycle nutrients.
- **Food chain** steps are **trophic levels**: producer → herbivore → carnivore.
- Plants capture **1% of sunlight**; only **10% of energy** passes up each level.
- Energy flow is one-way, so chains have only 3-4 levels.
- **Biological magnification**: pesticides build up, highest at top.
- **Ozone** blocks UV; damaged by **CFCs**; UNEP 1987 agreement.
- **Biodegradable** waste breaks down; **non-biodegradable** (plastic) persists.

Key facts

- $O_2 \xrightarrow{(UV)} O + O$; $O + O_2 \rightarrow O_3$
- 10% law: $10,000 \text{ J} \rightarrow 1,000 \rightarrow 100 \rightarrow 10 \text{ J}$

Diagrams to practise

- Food chain with trophic levels

Exam focus: how to score

- **10% law calculations.**
- Why decomposers matter; why chains are short.
- Biodegradable vs non-biodegradable examples; harm from ozone loss.

★ Important questions from CBSE sample papers

- If the 4th trophic level has 10 kJ, energy at producers? Which level gets most pesticide? (SQP 2026-27, 3 marks)
- A fish eats insect larvae that eat algae. Its trophic level? (SQP 2026-27, 1 mark)
- A: 1% of energy passes from one trophic level to the next. R: About 10% of food eaten is available as chemical energy for the next level. (SQP 2026-27, 1 mark)

Remember: Sun → 1% → plants → 10% each step up.

Class X

Social Science

One-page chapter summaries
Large print • CBSE 2026-27 syllabus

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Chapter H1: History 1: The Rise of Nationalism in Europe

Class X • Social Science • CBSE 2026-27

Big idea: After the French Revolution, the idea that people sharing a language, culture and history should form one nation-state spread across Europe and redrew its map.

Key points

- **Frédéric Sorrieu (1848)** pictured a world of 'democratic and social republics'.
- **French Revolution (1789)**: sovereignty to citizens; *la patrie*, *le citoyen*, tricolour, National Assembly.
- **Napoleonic Code (1804)**: equality before law, right to property, no privilege by birth; feudalism and serfdom abolished.
- **Liberal nationalism** of the middle class: freedom, government by consent, free markets; Prussia's 1834 Zollverein.
- **Conservatism after 1815**: Treaty of Vienna, autocratic regimes, censorship; revolutionaries like **Giuseppe Mazzini** (Young Italy, Young Europe) went underground.
- **Romanticism**: folk songs, poetry, language (Herder, Grimm brothers, Polish). **Greek Independence** won wide European support.
- **1848**: hunger revolts; liberals' **Frankfurt Parliament** failed when the Prussian king refused its crown.
- **Unification**: Germany by **Bismarck** (William I emperor, 1871); Italy by **Cavour, Garibaldi** (Victor Emmanuel II, 1861).
- Britain formed by slow process (Act of Union 1707; Ireland 1801). Nations shown as women: **Marianne** (France), **Germania**. Balkan rivalry led to the First World War.

Formulas, definitions & facts

- **1789** French Revolution • **1804** Civil Code • **1815** Treaty of Vienna (host **Metternich**)
- **1821** Greek struggle begins → **1832** Treaty of Constantinople: Greece independent
- **1848** Frankfurt Parliament • **1861** Italy united • **1871** Germany united
- **Allegory**: an abstract idea (liberty, nation) shown through a person or thing.
- **Symbols**: broken chains = freedom; oak crown = heroism; red cap = liberty.

Exam focus: how to score

- **Treaty of Vienna provisions** (5 marks): Bourbons restored; buffer states around France; 39-state German Confederation kept.
- Napoleon as administrator: list Code + abolition of feudalism + uniform weights, measures and currency.
- Culture and nationalism: Romanticism, folk culture, language, allegories (Marianne, Germania).
- Picture-based MCQs come from Sorrieu's print and the Napoleon 'postman' cartoon: learn the symbols.

★ Important questions from CBSE sample papers

- 'Female figures became an allegory of the nation in 19th-century Europe.' Elaborate with examples. (SQP 2026-27, 3 marks)
- Assess the role of the Greek War of Independence in shaping nationalist consciousness among educated Europeans. (SQP 2026-27, 3 marks)
- 'The Treaty of Vienna (1815) was drawn up to undo the changes of the Napoleonic wars.' Highlight its significant provisions. (SQP 2025-26, 5 marks)
- 'In Britain the nation-state was the result of a long-drawn-out process, not a sudden revolution.' Analyse. (SQP 2025-26, 5 marks)

Remember: France gave the idea, Vienna tried to stop it, Bismarck and Cavour finished it: 1789 → 1815 → 1848 → 1871.

Chapter H2: History 2: Nationalism in India

Class X • Social Science • CBSE 2026-27

Big idea: Under Gandhiji, many groups joined the fight against colonial rule through satyagraha, though each understood swaraj in its own way.

Key points

- **First World War:** higher taxes, price rises, forced recruitment and famine angered people.
- **Satyagraha** (truth, non-violence): Champaran (indigo farmers), Kheda (peasants), Ahmedabad (mill workers).
- **Rowlatt Act (1919):** detention without trial for two years → hartal on 6 April; **Jallianwala Bagh massacre, Amritsar, 13 April 1919** (General Dyer).
- **Khilafat + Non-Cooperation (1921):** surrender titles, boycott councils, schools, courts and foreign cloth; halted after **Chauri Chaura (Feb 1922)**.
- Other streams: **Awadh** peasants (Baba Ramchandra), **Gudem Hills** revolt (Alluri Sitaram Raju), **Assam plantation workers**.
- **Simon Commission (1928):** no Indian member → 'Go back Simon'. **Lahore Congress (Dec 1929, Nehru)** demanded **Purna Swaraj**; 26 Jan 1930 Independence Day.
- **Salt March:** Sabarmati to **Dandi**, 78 volunteers, 240 miles, 24 days; salt law broken on 6 April 1930 → **Civil Disobedience Movement**.
- **CDM:** rich peasants, women, business (FICCI 1927, G.D. Birla) joined; Dalits (Ambedkar → **Poona Pact 1932**) and many Muslims stayed away.
- **Collective belonging:** Bharat Mata (Abanindranath Tagore), 'Vande Mataram' (Bankim), folklore (Natesa Sastri), flags, history.

Formulas, definitions & facts

- **1915** Gandhiji returns • **1919** Rowlatt Act, Jallianwala Bagh • **1921** NCM
- **1922** Chauri Chaura • **1928** Simon Commission • **1929** Lahore session
- **1930** Dandi March • **5 Mar 1931** Gandhi-Irwin Pact • **Dec 1931** 2nd Round Table Conference
- **Swaraj Party:** C.R. Das and Motilal Nehru (to enter councils).
- **Picket:** protest blocking entry to a shop or office.

Map work

- Congress sessions: **Calcutta (Sept 1920)**, **Nagpur (Dec 1920)**, **Madras (1927)**.
- **Champaran** (Bihar, indigo) • **Kheda** (Gujarat, peasants) • **Ahmedabad** (mill workers).
- **Amritsar** (Jallianwala Bagh, 13 Apr 1919) • **Dandi** (Gujarat coast, salt law broken).

Exam focus: how to score

- Economic effects of NCM (5 marks): boycott, foreign cloth imports halved 1921-22 (Rs 102 cr → 57 cr), Indian mills and khadi grew.
- Why groups joined CDM and why some held back: answer group by group (peasants, business, workers, women, Dalits).
- Why was salt chosen? Consumed by rich and poor alike, so it united everyone.
- **Map (2 marks):** practise every place in the Map work box.

★ Important questions from CBSE sample papers

- Evaluate the economic consequences of the Non-Cooperation Movement for colonial rule in India. (SQP 2026-27, 5 marks)
- How did Indian merchants and industrialists associate themselves with the Civil Disobedience Movement, and why? (SQP 2026-27, 5 marks)
- 'The Salt March became an effective tool of resistance against colonialism.' Analyse. (SQP 2025-26, 3 marks)

Remember: R-J-K-N-C-S-L-D: Rowlatt, Jallianwala, Khilafat, Non-Cooperation, Chauri Chaura, Simon, Lahore, Dandi.

Chapter H3: History 3: The Making of a Global World

Class X • Social Science • CBSE 2026-27

Big idea: For centuries, trade, travel, food and even germs linked distant regions; the 16th-century European voyages shrank the world further.

Key points

- **Board exam: only sections 1 to 1.3 (pre-modern world)**. Sections 2 to 4 (1815 onwards) are for the internally assessed project.
- Early links: Indus valley–West Asia coastal trade (3000 BCE); **cowries** from the Maldives reached China and East Africa.
- **Silk routes**: land and sea routes linking Asia, Europe and North Africa, named after **Chinese silk** going west; also carried pottery, Indian textiles and spices; gold and silver came back.
- Trade and culture travelled together: Christian missionaries, Muslim preachers and **Buddhism** spread along the silk routes.
- **Food travels**: noodles may have gone west to become spaghetti; potatoes, maize, tomatoes, chillies, groundnuts and soya came from **the Americas** after Columbus.
- New crops could mean life or death: the **potato** fed Europe's poor; the **Irish Potato Famine (1845–49)** killed about 1,000,000 people.
- 16th century: Europeans found sea routes to Asia and America. **Silver from Peru and Mexico** boosted Europe's wealth and its trade with Asia; El Dorado legends.
- **Conquest of America**: the Spanish 'weapon' was **germs like smallpox**, which killed natives who had no immunity.
- Poverty, disease and religious persecution made many Europeans flee to America. China withdrew; Europe became the centre of world trade.

Formulas, definitions & facts

- **Silk routes**: thrived from before the Christian Era to about the 15th century.
- **El Dorado**: fabled city of gold in South America.
- **Dissenter**: one who refuses to accept established beliefs and practices.
- **Americas**: cut off from regular contact with the world until the 16th century.

Exam focus: how to score

- 2-mark 'justify' questions: give exactly two examples from the text (silk routes, potato, smallpox).
- Smallpox answer: Europeans immune, natives not; disease spread ahead of conquerors and destroyed whole communities.
- Crops answer: name the crops from the Americas and the Irish famine example.

★ Important questions from CBSE sample papers

- 'The most powerful weapon of the Spanish conqueror was not a conventional military weapon at all.' Justify with two reasons. (SQP 2026-27, 2 marks)
- 'The Silk route was a good example of vibrant pre-modern trade and cultural links.' Explain with two examples. (SQP 2025-26, 2 marks)
- 'Sometimes the new crops could make the difference between life and death.' Explain with two examples. (SQP 2025-26, 2 marks)

Remember: Silk, spaghetti, smallpox: trade, food and germs made the first global world.

Chapter H4: History 4: The Age of Industrialisation

Class X • Social Science • CBSE 2026-27

Big idea: Periodic (school) tests only, not in the board exam. Industrial growth came slowly, hand labour stayed important, and Indian weavers lost out under colonial rule.

Key points

- **Proto-industrialisation:** before factories, merchants gave money to peasants and artisans in villages to produce for international markets.
- First factories: **cotton mills** in England from the 1730s; cotton and iron and steel led growth. Most workers still did hand work in 1850s Britain.
- Many Victorian industrialists preferred **hand labour**: labour was cheap, demand was seasonal, and upper classes valued hand-made goods.
- Workers' lives: seasonal jobs, unemployment fears; women attacked the **Spinning Jenny** because it took away their work.
- Before British rule, Indian fine textiles ruled world markets via **Surat, Masulipatnam, Hoogly**; these ports declined as the East India Company took control.
- The Company appointed paid **gomasthas** to supervise weavers and stop them selling to others; weavers clashed with them.
- Manchester imports and cotton price rises ruined Indian weavers. **First World War:** imports fell, Indian mills supplied the army, so production rose.
- Early Indian industrialists: Dwarkanath Tagore, Dinshaw Petit, Jamsetjee Tata (wealth partly from China trade). **Fly shuttle** raised handloom output; advertising created markets.

Formulas, definitions & facts

- **Proto-industrialisation:** early phase of industrial production before factories.
- **Gomastha:** paid Company servant who supervised weavers and checked cloth quality.
- **Spinning Jenny** (James Hargreaves, 1764): one worker turned several spindles.
- **Fly shuttle:** device to move the weft, letting weavers work wider looms faster.

Exam focus: how to score

- Use for school periodic tests and the 5-mark internal assessment only.
- Reason-type answers: why hand labour was preferred, why Surat declined, why output rose in the First World War.

★ Important questions from CBSE sample papers

- Why did some industrialists in nineteenth-century Europe prefer hand labour over machines? (NCERT Ex, Discuss Q1)
- How did the East India Company procure regular supplies of cotton and silk textiles from Indian weavers? (NCERT Ex, Discuss Q2)
- Why did industrial production in India increase during the First World War? (NCERT Ex, Discuss Q4)

Remember: Cheap hands, seasonal work: why machines came slowly.

Chapter H5: History 5: Print Culture and the Modern World

Class X • Social Science • CBSE 2026-27

Big idea: Print made books cheap and widely available, spread new ideas and debates, and helped bring religious, political and social change.

Key points

- **China:** woodblock hand printing from AD 594; Buddhist missionaries took it to **Japan** c. AD 768–770. The **Diamond Sutra** (AD 868) is the oldest Japanese book.
- **Marco Polo** brought woodblock knowledge to Italy in 1295. **Gutenberg** perfected the printing press by 1448; his first book was the **Bible** (about 180 copies).
- **Print revolution:** a new reading public, books for ordinary people; oral and reading cultures mixed. Fear of 'dangerous' ideas grew.
- **Religion:** Martin Luther's **Ninety-Five Theses (1517)** began the **Protestant Reformation**; the miller Menocchio was executed; Church's **Index of Prohibited Books (1558)**.
- **18th century:** Enlightenment thinkers (Voltaire, Rousseau) spread reason; print created conditions for the **French Revolution**.
- **19th century:** children, women, workers became readers; lending libraries, cheap novels, **Penny Magazines**.
- **India:** press came to **Goa** with Portuguese missionaries (mid-16th c.); first Tamil book 1579 (Cochin). **Hickey's Bengal Gazette (1780)** began English newspapers.
- Reform debates: **Rammohun Roy's Sambad Kaumudi (1821)**; Deoband (1867) fatwas; women writers (**Rashsundari Debi's Amar Jiban, 1876**); **Phule's Gulamgiri (1871)** on caste.
- Censorship: **Vernacular Press Act (1878)** let the government seize presses; Tilak wrote in **Kesari** and was imprisoned in 1908.

Formulas, definitions & facts

- **594** China woodblock • **868** Diamond Sutra • **1295** Marco Polo • **1448** Gutenberg
- **1517** Luther • **1558** Index • **1780** Bengal Gazette • **1878** Vernacular Press Act
- **Manuscript:** handwritten book; expensive, fragile, hard to read.
- **Calligraphy:** art of beautiful, stylised writing.
- Mercier: 'Tremble, therefore, tyrants of the world! Tremble before the virtual writer!'

Exam focus: how to score

- Effects of print on women, the poor and caste debates in India: 3-mark favourites.
- Arrange-in-order MCQs: Gutenberg → Luther → Menocchio → French Revolution.
- Source-based questions often use 'Print comes to India' and newspaper passages.

★ Important questions from CBSE sample papers

- Print comes to India passage: identify the newspaper that began English printing; how did Hickey show independence? (SQP 2026-27, 4 marks)
- 'By the seventeenth century, as urban culture bloomed in China, the uses of print diversified.' Explain with examples. (SQP 2024-25, 3 marks)
- Provide evidence that print culture had a significant impact on the social lives of women in India. (SQP 2023-24, 3 marks)

Remember: Woodblock → Gutenberg → Luther → Revolution → Bengal Gazette: print travels east to west and back to India.

Chapter G1: Geography 1: Resources and Development

Class X • Social Science • CBSE 2026-27

Big idea: Resources come from nature, technology and institutions working together; they must be planned and used sustainably, especially land and soil.

Key points

- **Resource:** anything in the environment that meets our needs and is technologically possible, economically viable and culturally acceptable.
- Types by **origin** (biotic/abiotic), **exhaustibility** (renewable/non-renewable), **ownership** (individual, community, national, international), **development status**.
- **Development status:** **potential** (not yet used), **developed** (surveyed), **stock** (no technology yet), **reserves** (part of stock usable with existing technology).
- Problems: depletion for a few people's greed, wealth in few hands, global warming and land degradation. **Rio Earth Summit (1992), Agenda 21.**
- **Resource planning:** identify and map resources; plan with technology, skill and institutions; match with national development plans.
- **Land:** about **43% plains, 30% mountains, 27% plateau**. Net sown area over **80%** in Punjab and Haryana, under **10%** in Arunachal, Mizoram, Manipur, A&N.
- Forest cover is below the desired **33%** (National Forest Policy, 1952). Land degraded by mining, overgrazing, over-irrigation and industrial waste.
- **Soils:** alluvial, black (regur), red and yellow, laterite, arid and forest soils.
- **Soil erosion:** gullies/ravines (bad land, Chambal), sheet erosion. Fixes: contour ploughing, terraces, strip cropping, shelter belts.

Formulas, definitions & facts

- **Alluvial:** most widespread, northern plains; good for sugarcane, paddy, wheat, pulses.
- **Black (regur):** Deccan lava; holds moisture; **cotton**. **Red & yellow:** iron gives red colour.
- **Laterite:** intense leaching in heavy rain; good for **cashew, tea, coffee** with manure.
- **Arid:** sandy, saline, low humus. **Forest:** hilly areas, varies by slope.
- **Sustainable development:** development without harming the needs of future generations.

Map work

- **Major soil types** of India (identify): alluvial (northern plains, coasts), black (Deccan), red & yellow, laterite, arid (Rajasthan), forest soils.

Exam focus: how to score

- **Map: identify major soil types** on India's outline map.
- Classify resources with an example for each type; potential vs stock vs reserve MCQs.
- 5-mark: measures to prevent soil erosion; choose soil for a given crop (sugarcane, cotton, jowar).
- Read the land-use pie chart: what 43% plains means for farming and industry.

★ Important questions from CBSE sample papers

- A known mineral deposit that cannot be used due to lack of technology fits which category of resource? (SQP 2026-27, 1 mark)
- Analyse the measures adopted to prevent soil erosion caused by natural forces. (SQP 2024-25, 5 marks)
- Mohan wants to grow sugarcane, cotton and jowar. Help him identify the right soil type and its properties. (SQP 2024-25, 5 marks)

Remember: Black for cotton, alluvial for grain, laterite for cashew: match the soil to the crop.

Chapter G2: Geography 2: Forest and Wildlife Resources

Class X • Social Science • CBSE 2026-27

Big idea: India is rich in biodiversity, but forests and wildlife are under stress; laws, projects and local communities together are needed to protect them.

Key points

- Humans are part of a **web of ecology**: plants, animals and microbes keep our air, water and soil healthy. Forests are the **primary producers**.
- Conservation protects ecological diversity, life-support systems and **genetic diversity** for breeding and farming.
- **Indian Wildlife (Protection) Act, 1972**: list of protected species, hunting banned, habitats protected, trade restricted.
- **Project Tiger (1973)**: tigers had fallen to **1,827**; threats are poaching, lost habitat, less prey. Reserves: Corbett, Sunderbans, Bandhavgarh, Sariska, Manas, Periyar.
- Forest types by management: **Reserved** (over half, most valuable), **Protected** (about one-third), **Unclassed** (government, private and community land).
- **Madhya Pradesh** has the largest permanent forest area (75% of its forest). North-eastern states: mostly unclassified forests run by communities.
- **Community action**: Sariska villagers fought mining; 5 villages in Alwar made the **Bhairodev Dakav 'Sonchuri'**; the **Chipko movement** saved Himalayan trees.
- **Beej Bachao Andolan** (Tehri) and **Navdanya**: crops without synthetic chemicals. **Joint Forest Management** (Odisha, 1988) involves villagers.
- **Sacred groves**: forests left untouched as abodes of gods; Mundas and Santhals worship mahua and kadamba trees.

Formulas, definitions & facts

- **Biodiversity**: variety of plant and animal life in an area, linked through many dependencies.
- **Permanent forest estates**: reserved + protected forests kept for timber and protection.
- **JFM**: local communities help restore degraded forests and get non-timber forest produce.
- Plants first added to protected list in **1991** (six species).

Exam focus: how to score

- Match forest types to states (reserved, protected, unclassified): common 1-mark MCQ.
- 4-mark case: role of communities, with **Chipko, JFM, Bhairodev Dakav Sonchuri** as examples.
- Give reasons why conservation is needed: ecology, genetic diversity, livelihoods.

★ Important questions from CBSE sample papers

- Community forest conservation case: one objective; how participation helps (two examples); name the movement. (SQP 2026-27, 4 marks)
- Identify the correct facts about Joint Forest Management. (SQP 2024-25, 1 mark)
- Which forest category best applies to places like Jammu and Kashmir, Andhra Pradesh and Kerala? (SQP 2025-26, 1 mark)

Remember: Hug (Chipko), Share (JFM), Guard (Sonchuri): people protect forests best.

Chapter G3: Geography 3: Water Resources

Class X • Social Science • CBSE 2026-27

Big idea: Water is renewable but scarce because of over-use and unequal access; dams help, but rainwater harvesting is the sustainable answer.

Key points

- Only a small share of Earth's water is usable fresh water. **Water scarcity** comes mainly from over-exploitation, excess use and unequal access, not only low rain.
- Causes: large population, irrigation for farming, industries, urbanisation, and pollution by domestic and industrial waste.
- Ancient hydraulic works: **Sringaverapura** near Prayagraj (1st century BC) channelled Ganga flood water.
- **Multipurpose river projects**: irrigation, power, water supply, flood control, fish and navigation. Nehru called dams the '**temples of modern India**'.
- Problems of dams: disturb river flow and sediment, harm aquatic life, displace people, cause conflicts between states and can even trigger floods.
- **Sardar Sarovar Dam** on the **Narmada** (Gujarat) is one of India's largest water projects; **Hirakud** (Mahanadi) combines conservation with flood control.
- **Rainwater harvesting**: **guls/kuls** (Western Himalayas), rooftop harvesting (Rajasthan), **khadins and johads** (Rajasthan), **tankas** (Bikaner, Phalodi, Barmer).
- **Gendathur** (Karnataka) has rooftop harvesting in most homes; **Shillong** collects rooftop water; **Tamil Nadu** made rooftop harvesting compulsory.
- **Bamboo drip irrigation** in Meghalaya: 200-year-old system carrying stream water through bamboo pipes.

Formulas, definitions & facts

- **Palar pani**: rainwater, the purest form of natural water (Rajasthan).
- **Tanka**: underground tank linked to the rooftop to store rainwater.
- **Dam**: barrier across flowing water that controls and directs its flow.
- **Bhakra Nangal**: Satluj-Beas basin, used for hydel power and irrigation.

Map work

- **Salal** (Chenab, J&K) • **Bhakra Nangal** (Satluj, HP/Punjab) • **Tehri** (Bhagirathi, Uttarakhand)
- **Rana Pratap Sagar** (Chambal, Rajasthan) • **Sardar Sarovar** (Narmada, Gujarat)
- **Hirakud** (Mahanadi, Odisha) • **Nagarjuna Sagar** (Krishna, Telangana/AP) • **Tungabhadra** (Karnataka)

Exam focus: how to score

- **Map dams (3-mark Geo map)**: Narmada (Sardar Sarovar), Satluj-Beas (Bhakra Nangal), Mahanadi (Hirakud).
- Advantages vs problems of multipurpose projects: give balanced points in 5-mark answers.
- Suggest traditional harvesting methods for a dry district: name + region + how it works.

★ Important questions from CBSE sample papers

- Suggest two traditional rainwater harvesting practices for a drought-prone district. (SQP 2026-27, 2 marks)
- Water scarcity case: one future cause; why install a submersible pump in Rajasthan; why conserve water. (SQP 2024-25, 4 marks)
- Which state has made rooftop water harvesting compulsory? (SQP 2025-26, 1 mark)

Remember: Dams are temples, but tankas, johads and rooftops save the day.

Chapter G4: Geography 4: Agriculture

Class X • Social Science • CBSE 2026-27

Big idea: Two-thirds of Indians depend on farming; crops differ by season, soil and climate, and reforms aim to make farming productive and fair.

Key points

- **Farming types:** **primitive subsistence** ('slash and burn', e.g. jhumming in the North-East), **intensive subsistence** (small plots, high labour), **commercial** (HYV seeds, fertilisers).
- **Plantation:** one crop on a large estate with capital and labour, linked to industry (tea, coffee, rubber, sugarcane, banana).
- **Cropping seasons:** **Rabi** sown Oct-Dec, harvested Apr-Jun (wheat, gram, mustard); **Kharif** sown with monsoon (rice, maize, jowar, cotton, jute); **Zaid** in summer (watermelon, cucumber).
- **Rice:** kharif; above 25°C, high humidity, over 100 cm rain; India 2nd after China. **Wheat:** rabi; cool season, 50–75 cm rain; Ganga-Satluj plains and Deccan black soil.
- **Millet**s (jowar, bajra, ragi): highly nutritious; ragi rich in iron and calcium. **Pulses:** India largest producer and consumer; fix nitrogen.
- **Sugarcane:** 21–27°C, 75–100 cm rain; India 2nd after Brazil. **Groundnut:** kharif; Gujarat leads.
- **Tea:** warm, moist, frost-free; frequent showers; labour-intensive (Assam, Darjeeling, TN, Kerala). **Coffee:** **Arabica** from Yemen, first on **Baba Budan Hills**.
- **Rubber:** over 200 cm rain, above 25°C (Kerala). **Cotton:** black soil, 210 frost-free days. **Jute** = 'golden fibre' (West Bengal).
- **Reforms:** land reforms, Green and White Revolutions, **Kisan Credit Card**, crop insurance; **Bhoodan-Gramdan** of Vinoba Bhave.

Formulas, definitions & facts

- **India's rank:** rice 2nd, sugarcane 2nd, tea 2nd, cotton 2nd, pulses 1st, fruits & vegetables 2nd.
- **Aus, Aman, Boro:** three rice crops a year in Assam, West Bengal and Odisha.
- **Sericulture:** rearing silkworms for silk. **Horticulture:** growing fruits and vegetables.

Map work

- **Major rice areas** (plains of North and North-East, coasts, deltas; Punjab-Haryana with irrigation) and **wheat areas** (Ganga-Satluj plains, Deccan black soil).
- Leading states (identify): **sugarcane** UP • **tea** Assam • **coffee** Karnataka • **rubber** Kerala • **cotton** (Deccan black-soil states such as Gujarat, Maharashtra) • **jute** West Bengal.

Exam focus: how to score

- **5-mark crop comparisons:** tea vs coffee, rice vs wheat; quote temperature, rainfall and soil.
- Why is rice commercial in Punjab-Haryana but subsistence in Odisha? Think irrigation, market and farm size.
- Map: rice and wheat areas; leading states for sugarcane, tea, coffee, rubber, cotton, jute.

★ Important questions from CBSE sample papers

- A farmer is choosing between tea and coffee: highlight the difference in their growing conditions. (SQP 2026-27, 5 marks)
- Moderate rain, cool winters, assured irrigation: rice or wheat? Give reasons. (SQP 2026-27, 5 marks)
- Rice is commercial in Haryana and Punjab but subsistence in Odisha. Explain why. (SQP 2025-26, 2 marks)
- Name the term for growing fruits and vegetables and write its features in India. (SQP 2024-25, 3 marks)

Remember: Rabi = Return of cold (winter sowing); Kharif = monsoon sowing.

Chapter G5: Geography 5: Minerals and Energy Resources

Class X • Social Science • CBSE 2026-27

Big idea: Minerals and energy run our industries but are limited, so they must be used carefully and non-conventional energy expanded.

Key points

- **Minerals** occur in veins and lodes, beds and layers, residual mass (bauxite), **placer deposits** (gold, platinum in valley sands) and ocean water.
- **Ferrous**: iron ore, manganese. **Non-ferrous**: copper, bauxite. **Non-metallic**: mica, limestone. **Energy**: coal, petroleum, natural gas.
- **Iron ore belts**: Odisha-Jharkhand (Badampahar, Gua, Noamundi), **Durg-Bastar-Chandrapur (Bailadila)**: best physical properties for steel, exported via Visakhapatnam).
- **Ballari-Chitradurga-Chikkamagaluru-Tumakuru: Kudremukh**, a 100% export unit; ore sent as slurry by pipeline to near Mangaluru. Maharashtra-Goa belt exports via Marmagao.
- **Bauxite**: Amarkantak, Maikal hills, Bilaspur-Katni; Odisha leads (Panchpatmali, Koraput). **Mica**: Koderma-Gaya-Hazaribagh belt.
- Mining hazards: lung disease for miners, roof collapse and flooding; polluted water, land and air nearby.
- **Coal**: Gondwana coal of the **Damodar valley** (Jharia, Raniganj, Bokaro); tertiary coal in the North-East; **lignite** at **Neyveli** (TN).
- **Petroleum**: Mumbai High, Gujarat (Ankleshwar), Assam (**Digboi**, oldest). **Nuclear**: uranium, thorium.
- **Non-conventional**: **solar**, **wind** (Nagercoil-Madurai belt), **tidal** (Gulf of Khambhat, Kuchchh), **geothermal** (Manikaran, Puga Valley), **biogas** ('gobar gas').

Formulas, definitions & facts

- **Mineral**: homogenous, naturally occurring substance with a definable internal structure.
- **Ore**: mineral mixed with other elements, worth mining.
- **Hematite**: most important industrial iron ore. **Magnetite**: finest ore, up to 70% iron.
- **Conservation**: recycling metals, scrap use, substitutes, improved technology.

Map work

- **Iron ore mines**: Mayurbhanj, Durg, Bailadila, Bellary (Ballari), Kudremukh.
- **Coal mines**: Raniganj, Bokaro, Talcher, Neyveli.
- **Oil fields**: Digboi, Naharkatia, Mumbai High, Bassien, Kalol, Ankaleshwar.
- **Power plants**: thermal (Namrup, Singrauli, Ramagundam); nuclear (Narora, Kakrapar, Tarapur, Kalpakkam).

Exam focus: how to score

- Identify/label mines, oil fields and power plants on the map (see box).
- 5-mark: why Odisha suits a bauxite industry; why coal is India's most important fossil fuel.
- Explain mining's harm to environment and miners' health; argue for non-conventional energy.

★ Important questions from CBSE sample papers

- Which statements about placer deposits are correct? (SQP 2026-27, 1 mark)
- Which iron ore belt has the best physical properties for steel making? (SQP 2026-27, 1 mark)
- Person P is advised to set up a bauxite industry in Odisha. Analyse the reasons. (SQP 2025-26, 5 marks)
- 'Coal is the most important and abundant fossil fuel in India.' Justify its role in the economy. (SQP 2025-26, 5 marks)

Remember: Bailadila best ore, Kudremukh all export, Neyveli lignite, Digboi oldest oil.

Chapter G6: Geography 6: Manufacturing Industries

Class X • Social Science • CBSE 2026-27

Big idea: Manufacturing turns raw materials into higher-value goods; it is the backbone of development, but must control pollution.

Key points

- **Importance:** modernises agriculture, creates jobs, reduces poverty and regional gaps, earns foreign exchange through exports.
- **Agriculture and industry move hand in hand:** agro-industries buy farm raw material and sell pumps, fertilisers, pipes and tools to farmers.
- **Classification:** by raw material (agro/mineral), role (basic/consumer), capital, **ownership** (public, private, joint, cooperative) and bulk of material (heavy/light).
- **Cotton textiles:** first mill in Mumbai, 1854. **Spinning is centralised but weaving decentralised**, so good yarn is not fully used and fabric is poorer.
- **Jute:** first mill at Rishra (1855); mills along the **Hugli** for jute supply, water, labour and port. **Sugar:** bulky cane, so mills sit near farms; moving south and west.
- **Iron and steel:** basic industry; most plants in the **Chhotanagpur plateau** (cheap ore, coal, labour). **Aluminium** smelting is 2nd metallurgical industry; needs cheap power.
- **Chemicals, fertilisers, cement** (first plant Chennai, 1904), **automobiles**, and **IT/electronics:** **Bengaluru is the 'electronic capital of India'.**
- **Pollution:** air (smoke, gases), water (dyes, effluents), thermal (hot water), land (waste), noise.
- **Control:** treat effluents (primary, secondary, tertiary), recycle water, harvest rain, use electrostatic precipitators. **NTPC** shows the way.

Formulas, definitions & facts

- **Manufacturing:** producing goods in large quantities from raw materials.
- **Agro-based:** cotton, jute, silk, wool, sugar, vegetable oil. **Mineral-based:** iron & steel, cement, aluminium.
- **Public sector:** BHEL, SAIL. **Private:** TISCO, Dabur. **Cooperative:** sugar in Maharashtra, coir in Kerala.

Map work

- **Cotton textiles:** Mumbai, Indore, Surat, Kanpur, Coimbatore.
- **Iron & steel plants:** Durgapur, Bokaro, Jamshedpur, Bhilai, Vijayanagar, Salem.
- **Software technology parks:** Noida, Gandhinagar, Mumbai, Pune, Hyderabad, Bengaluru, Chennai, Thiruvananthapuram.

Exam focus: how to score

- Location factors: raw material, power, labour, market, transport and port.
- Pollution types + control steps make 3- and 5-mark answers; quote **NTPC** as a model.
- Assertion-reason: Bengaluru's IT growth is NOT due to ports.

★ Important questions from CBSE sample papers

- Why does India's weaving sector produce lower-quality fabric despite strong spinning capacity? (SQP 2026-27, 1 mark)
- Assertion: Bengaluru is a leading IT and electronics centre. Reason: it is close to major ports. (SQP 2026-27, 1 mark)
- 'Agriculture and industry are not exclusive of each other. They move hand in hand.' Justify with examples. (SQP 2024-25, 2 marks)
- Pollution case: how do manufacturing industries cause different types of pollution? (SQP 2025-26, 4 marks)

Remember: Mumbai 1854 cotton, Rishra 1855 jute, Chennai 1904 cement: India's industrial firsts.

Chapter G7: Geography 7: Lifelines of National Economy

Class X • Social Science • CBSE 2026-27

Big idea: Board exam: map pointing only. Transport and communication link producers to markets and India to the world.

Key points

- **Roads: Golden Quadrilateral** links Delhi–Kolkata–Chennai–Mumbai–Delhi; North–South and East–West corridors.
- **National Waterways:** **NW-1** Ganga, Prayagraj–Haldia (1620 km); **NW-2** Brahmaputra, Sadiya–Dhubri (891 km); **NW-3** West Coast Canal, Kerala (205 km).
- Sea carries **95%** of India's trade by volume (68% by value); **12 major** ports handle most foreign trade.
- **Deendayal Port (Kandla):** first port after Independence, built to replace Karachi; a tidal port in Kutch.
- **Mumbai:** biggest port, natural harbour; **JNPT** relieves it. **Marmagao** (Goa): premier iron ore port. **New Mangalore:** Kudremukh ore. **Kochi:** lagoon harbour.
- **Tuticorin (V.O. Chidambaranar):** natural harbour in TN. **Chennai: one of the oldest artificial ports.** **Visakhapatnam:** deepest landlocked port.
- **Paradip** (Odisha): iron ore. **Kolkata:** inland riverine tidal port needing constant dredging; **Haldia** built to ease its load.
- **Air travel:** fastest; vital for difficult terrain like the North-East.

Formulas, definitions & facts

- **Deepest landlocked:** Visakhapatnam • **Biggest:** Mumbai • **Oldest artificial:** Chennai
- **Iron ore ports:** Marmagao, New Mangalore, Paradip, Visakhapatnam
- **Subsidiary port:** Haldia (for Kolkata)

Map work

- **Sea ports, west coast:** Kandla, Mumbai, Marmagao, New Mangalore, Kochi.
- **Sea ports, east coast:** Tuticorin, Chennai, Visakhapatnam, Paradip, Haldia.
- **International airports:** Amritsar (Raja Sansi – Sri Guru Ram Das Ji), Delhi (Indira Gandhi), Mumbai (Chhatrapati Shivaji)
- Chennai (Meenambakkam), Kolkata (Netaji Subhash Chandra Bose), Hyderabad (Rajiv Gandhi).

Exam focus: how to score

- Only map items are tested in the board: practise all 10 ports and 6 airports.
- Map questions often describe a place ('seaport in West Bengal', 'airport in Tamil Nadu').
- Use a dot or symbol and write the name clearly next to it.

★ Important questions from CBSE sample papers

- On the outline map, locate and label Meenambakkam international airport. (SQP 2026-27, map 1 mark)
- Locate and label a major sea port in West Bengal and an international airport in Punjab. (SQP 2025-26, map 2 marks)
- Locate a seaport in West Bengal. (SQP 2024-25, map 1 mark)

Remember: West coast K-M-M-N-K (Kandla, Mumbai, Marmagao, New Mangalore, Kochi); east coast T-C-V-P-H.

Chapter P1: Political Science 1: Power-sharing

Class X • Social Science • CBSE 2026-27

Big idea: Sharing power among groups and levels of government reduces conflict and is the very spirit of democracy.

Key points

- **Belgium**: 59% Dutch (Flemish region), 40% French (Wallonia), 1% German; in **Brussels**, 80% French and 20% Dutch.
- Belgian model (constitution amended **four times, 1970–1993**): equal Dutch and French ministers; powers to state governments; separate Brussels government; elected **community government**.
- **Sri Lanka** (independent 1948): Sinhala 74%, Tamils 18% (Sri Lankan Tamils 13%, Indian Tamils 5%).
- **Majoritarian measures: 1956 Act** made Sinhala the only official language; preference to Sinhala in universities and jobs; state protects Buddhism.
- Result: Tamils felt alienated, demanded Tamil as official language, regional autonomy and equal jobs → demand for **Tamil Eelam** and **civil war**.
- **Prudential reason**: power sharing reduces conflict between social groups and gives **political stability**.
- **Moral reason**: people have a right to be consulted; this is the spirit of democracy and gives **legitimacy**.
- **Forms**: **horizontal** (legislature, executive, judiciary; **checks and balances**), **vertical** (federal: union, state, local), among **social groups**, among **parties**, **pressure groups and movements**.

Formulas, definitions & facts

- **Ethnic**: social division based on shared culture.
- **Majoritarianism**: belief that the majority community should rule the way it wants.
- **Civil war**: violent conflict between opposing groups within a country.
- **Coalition government**: government of two or more parties.
- **Checks and balances**: no organ has unlimited power; each checks the others.

Exam focus: how to score

- Compare Belgium vs Sri Lanka (accommodation vs majoritarianism): favourite 3–4 mark case.
- Learn all four forms with an example each; prudential vs moral MCQs.
- Belgian model: write any 2–4 provisions exactly.

★ Important questions from CBSE sample papers

- How were powers shared between the central and state governments in Belgium to avoid division of the country? (SQP 2026-27, 2 marks)
- From a prudential viewpoint, which argument best supports power sharing? (SQP 2026-27, 1 mark)
- Sri Lanka–Belgium case: two demands of Tamils; results of majoritarianism; two provisions of the Belgian model. (SQP 2025-26, 4 marks)
- 'India represents a classic example of power sharing.' Justify. (SQP 2024-25, 2 marks)

Remember: Belgium shared and stayed united; Sri Lanka imposed and broke into war.

Chapter P2: Political Science 2: Federalism

Class X • Social Science • CBSE 2026-27

Big idea: In a federation, power is divided between a central authority and its constituent units, each with its own constitutionally guaranteed powers.

Key points

- **Features of federalism**: two or more levels; each has its own jurisdiction; guaranteed by the Constitution; changes need both levels to agree; courts decide disputes; revenue sources specified.
- **Coming together** (USA, Switzerland, Australia): independent states unite. **Holding together** (India, Spain, Belgium): a large country shares power with states.
- India is a **Union of States**; the word 'federation' is not used, but it follows federal principles.
- **Three lists**: **Union** (defence, foreign affairs, banking, currency), **State** (police, trade, agriculture, irrigation), **Concurrent** (education, forest, trade unions, marriage, adoption, succession).
- **Residuary subjects** (e.g. computer software) go to the Union. Union Territories are run by the centre; some states have special status.
- How federalism is practised: **linguistic states**, a flexible **language policy** (Hindi official language, no imposition), and **centre-state relations** improved with coalition governments.
- **Decentralisation (1992 amendment)**: regular local elections; seats reserved for SC, ST, OBC; **one-third for women**; **State Election Commission**; states share powers and revenue.
- Rural: **gram panchayat** (sarpanch), **gram sabha**, panchayat samiti, **zila parishad**. Urban: municipalities and municipal corporations (mayor).

Formulas, definitions & facts

- **Federalism**: system where power is divided between a central authority and constituent units.
- **Unitary system**: one level of government, or sub-units subordinate to the centre.
- **Jurisdiction**: area over which someone has legal authority.
- **Gram sabha**: all voters of a village; reviews the gram panchayat's work.
- **Panchayati Raj**: three tiers: village, block, district.

Exam focus: how to score

- 5-mark: 'What makes India a federal country?' Use the features and the three lists.
- 1992 amendment provisions: learn all five (key 5-mark question).
- 'Education is in which list and why?' and case-based questions on centre-state powers.

★ Important questions from CBSE sample papers

- Explain five provisions of the 1992 constitutional amendment that strengthened the third tier of democracy. (SQP 2026-27, 5 marks)
- 'The Indian Union is based on the principles of federalism.' What makes India a federal country? (SQP 2026-27, 5 marks)
- Highlight any two key features of federalism. (SQP 2025-26, 2 marks)
- Name two Union List subjects. In which list is 'Education', and why? (SQP 2023-24, 3 marks)

Remember: U-S-C-R: Union, State, Concurrent lists, and Residuary powers go to the Union.

Chapter P3: Political Science 3: Gender, Religion and Caste

Class X • Social Science • CBSE 2026-27

Big idea: Social differences can be expressed fairly in democratic politics, but sexism, communalism and casteism harm democracy.

Key points

- **Sexual division of labour:** housework and childcare seen as women's job; women's work is often unpaid and undervalued.
- **Feminist movements** demanded voting rights, education, work and equal status. Women still lag: literacy **54%** vs **76%** for men; lower pay; unequal sex ratio.
- **Representation:** women in Lok Sabha reached **14.36% in 2019**; under 5% in state assemblies. Panchayati Raj gives one-third of local seats to women.
- **Women's Reservation Act 2023** (Nari Shakti Vandan Adhiniyam): 33% of seats for women in Lok Sabha, state assemblies and Delhi Assembly.
- **Religion** is fine in politics when groups voice needs; **communalism** sees one religion as superior and its followers as one community against others.
- Forms of communalism: everyday beliefs and stereotypes, majority dominance or separate state demands, political mobilisation on religion, **communal violence**.
- **Secular state:** no official religion; freedom to profess any religion; no discrimination; state can intervene to ensure equality.
- **Caste:** untouchability is banned, but caste still shapes politics: parties pick candidates by caste; caste groups are mobilised.
- **Elections are not only about caste:** no constituency has one caste majority; voters split; ruling parties often lose.

Formulas, definitions & facts

- **Patriarchy:** system that values men more and gives them power over women.
- **Feminist:** person who believes in equal rights for women and men.
- **Communalism:** politics based on religious identity treated as superior to others.
- **Casteism:** politics where caste is the sole basis of community and voting.

Exam focus: how to score

- 3-mark: 'Elections are not only about caste': give 3 of the 4 arguments.
- List the forms of communalism and the constitutional provisions for a secular state.
- Areas of gender inequality: education, jobs, wages, sex ratio, safety, representation.

★ Important questions from CBSE sample papers

- 'Elections are all about caste' is far from true. Analyse with three arguments. (SQP 2026-27, 3 marks)
- 'Women in India face discrimination in many ways.' Highlight two aspects of life showing this inequality. (SQP 2025-26, 2 marks)
- Women empowerment has improved their status. Give three examples. (SQP 2024-25, 3 marks)

Remember: Difference is fine, domination is not: no sexism, no communalism, no casteism.

Chapter P4: Political Science 4: Political Parties

Class X • Social Science • CBSE 2026-27

Big idea: Political parties are necessary in modern democracies: they contest elections, form governments and shape public opinion.

Key points

- **Political party:** a group of people who come together to contest elections and hold power. Parts: **leaders, active members, followers.**
- **Functions:** contest elections; offer policies and programmes; make laws; form and run governments; act as **opposition**; shape public opinion; give access to welfare schemes.
- **Why needed:** without parties, every candidate is independent; no one can promise major policies; governments become uncertain.
- **Party systems:** **one-party** (China), **two-party** (USA, UK), **multiparty (India)**, often with alliances and coalitions.
- India has many parties because of its **social and geographical diversity.**
- **Recognition: State party:** 6% of votes + 2 seats in a state assembly election. **National party:** 6% in Lok Sabha or 4 states' assembly polls + 4 Lok Sabha seats. **Six** national parties (2023).
- **Challenges:** lack of internal democracy; **dynastic succession**; growing role of **money and muscle power**; lack of meaningful choice.
- **Reforms: anti-defection law**; candidates file an **affidavit** on property and criminal cases; parties must hold organisational elections and file income tax returns.

Formulas, definitions & facts

- **Partisan:** strongly committed to a party or faction.
- **Alliance/front:** parties join hands to contest and share power.
- **Defection:** an elected member leaving the party they were elected from.
- **Affidavit:** signed document stating facts, sworn before an officer.

Exam focus: how to score

- 5-mark: role/functions of parties, or the four challenges (with examples).
- Explain why India chose a multiparty system; compare national and state parties.
- Case questions often use the 'Need for political parties' passage.

★ Important questions from CBSE sample papers

- 'Need for political parties' case: why democracies cannot exist without parties; two functions; why India is multi-party. (SQP 2026-27, 4 marks)
- 'Political parties play a significant role in the effective working of a democracy.' Explain. (SQP 2025-26, 5 marks)
- Analyse how leadership succession poses a challenge to political parties in India. (SQP 2025-26, 5 marks)
- Analyse the role of a multiparty system in a democratic country like India. (SQP 2023-24, 5 marks)

Remember: Challenges = I-D-M-C: Internal democracy, Dynasty, Money-muscle, Choice.

Chapter P5: Political Science 5: Outcomes of Democracy

Class X • Social Science • CBSE 2026-27

Big idea: Democracy is better than other forms of government because it is accountable, responsive and legitimate, though it has not solved every problem.

Key points

- **Accountable, responsive and legitimate government:** regular, free and fair elections; open debate; **transparency** (citizens can check decisions; e.g. right to information).
- Democracies may be slower, but decisions are more acceptable and effective. Democracy is a people's own government, so it is **legitimate**.
- **Economic growth:** dictatorships have a slightly higher growth rate, but democracy is still preferable because of its other positive outcomes.
- **Inequality and poverty:** democracies have not reduced economic inequality much; the poor are a big share of voters but their needs are often ignored.
- **Accommodation of social diversity:** democracy handles differences and conflicts peacefully; majority must work with minorities; rule by majority $\neq$ one religious or ethnic group ruling.
- **Dignity and freedom:** democracy promotes dignity of individuals; equal treatment of women and of disadvantaged castes is now accepted and can be fought for legally.
- Democracy is a continuous process: people's expectations rise and they complain, which itself shows **successful democracy**.
- Democracy has not removed corruption or conflict, but it gives citizens the power to correct mistakes.

Formulas, definitions & facts

- **Transparency:** right and means to examine whether decisions follow correct procedure.
- **Legitimacy:** being accepted by the people as rightful.
- Equal treatment of women: easier for women to wage legal struggles for their rights.

Exam focus: how to score

- 5-mark: why democracy is better than dictatorship (accountability, dignity, conflict resolution).
- Balanced answers: show where democracy succeeds and where it fails (inequality, poverty).
- Cartoon MCQs: resource use by rich countries; corruption stories.

★ Important questions from CBSE sample papers

- Why is democracy regarded as the best form of governance in involving the most citizens as stakeholders in power? (SQP 2026-27, 2 marks)
- 'Democracy leads to peaceful and harmonious life among citizens in every sphere.' Support with arguments. (SQP 2025-26, 3 marks)
- What is the true meaning of 'equal treatment of women' as an ingredient of a democratic society? (SQP 2024-25, 1 mark)

Remember: A-R-L: Accountable, Responsive, Legitimate. Democracy's strength is that people can complain.

Chapter E1: Economics 1: Development

Class X • Social Science • CBSE 2026-27

Big idea: Different people have different development goals; income matters, but health, education and sustainability matter just as much.

Key points

- Development goals differ: people want more income but also **freedom, security, equal treatment, respect**; one person's goal may conflict with another's.
- **National development** means thinking of fair and just paths for all; it needs income and also good public facilities.
- **Per capita income** = total national income ÷ total population. The **World Bank** uses it to classify countries.
- World Bank (2024): **US\$ 66,500** or more = high income (rich); about **US\$ 2,300** or less = low income. India is a **lower middle-income** country.
- Average hides inequality; income alone cannot buy pollution-free air, medicines or good schools.
- **Haryana vs Kerala vs Bihar**: Haryana richest, but **Kerala** has the lowest IMR (6 vs 28) and highest literacy (94%) thanks to health, education and a good PDS.
- **Human Development Index** (UNDP): compares countries on **health, education and per capita income**.
- **Sustainability**: groundwater over-use and limited crude oil show resources must be saved for future generations.

Formulas, definitions & facts

- **Per capita income** = National income ÷ Population
- **IMR**: children dying before age 1 per 1000 live births.
- **Literacy rate**: literates as % of people aged 7 and above.
- **Net Attendance Ratio**: % of children aged 15-17 attending school.
- **Public Distribution System (PDS)**: ration shops giving food grains at low prices.

Exam focus: how to score

- Data questions: read the Haryana-Kerala-Bihar table; say which state is better developed and why.
- Explain why per capita income is a useful but limited measure.
- Know the HDI indicators and the meaning of sustainable development.

★ Important questions from CBSE sample papers

- Compare development indicators of three states (IMR, literacy, attendance); infer and suggest focus areas. (SQP 2026-27, 5 marks)
- Why do citizens often hold different opinions about national development goals? (SQP 2026-27, 1 mark)
- Human Development Report case: basis of UNDP comparison; explain human development. (SQP 2024-25, 4 marks)
- Explain the significance of per capita income. (SQP 2023-24, 2 marks)

Remember: Income is not everything: Kerala beats richer Haryana on health and schooling.

Chapter E2: Economics 2: Sectors of the Indian Economy

Class X • Social Science • CBSE 2026-27

Big idea: The economy has primary, secondary and tertiary sectors; the tertiary sector now produces the most, but most jobs are still in the primary sector.

Key points

- **Primary:** uses natural resources (farming, mining, fishing). **Secondary:** manufacturing. **Tertiary/service:** transport, banking, trade, IT.
- **GDP** = value of **final goods and services** produced in a year; counting intermediate goods would mean double counting.
- **Tertiary sector grew most:** basic services needed, farming and industry need transport and banking, higher incomes demand more services, new IT services.
- **Employment did not shift:** the primary sector still employs the most, as industry and services did not create enough jobs.
- **Disguised unemployment:** more people working than needed (e.g. 5 on a farm that needs 2). **Underemployment** is common in farming and the unorganised sector.
- **More jobs:** cheap credit, dams and canals, roads and storage, rural industries, health and education, tourism. **MGNREGA 2005: 100 days** of work a year (replaced in 2025 by **Viksit Bharat-G RAM G**).
- **Organised vs unorganised:** organised = registered, regular jobs, fixed hours, paid leave, PF; unorganised = low pay, no job security, irregular work.
- **Public sector** (owned by government, e.g. railways) vs **private sector** (profit-motive, e.g. TISCO, Reliance).

Formulas, definitions & facts

- **GDP** = value of all final goods and services produced in a country in a year
- **Intermediate goods:** used to make final goods (e.g. wheat for biscuits).
- **MGNREGA 2005** ('Right to Work'): 100 days' work or unemployment allowance; replaced in 2025 by Viksit Bharat-G RAM G.

Exam focus: how to score

- 3-mark case: rural underemployment—name it and give two or three solutions.
- 5-mark: organised vs unorganised sector differences (job security, wages, benefits).
- Calculation MCQ: find one sector's GDP share from the total.

★ Important questions from CBSE sample papers

- Many villagers work on farms but lack proper wages: give the reason and two ways to tackle it. (SQP 2026-27, 3 marks)
- GDP is ₹900 crore; primary ₹300 crore, tertiary ₹400 crore. Find the secondary share and the largest sector. (SQP 2026-27, 1 mark)
- Person M works in the organised sector and N in the unorganised sector. Analyse the key differences. (SQP 2025-26, 5 marks)
- Why has the tertiary sector become so important in India? Give three reasons. (SQP 2024-25, 3 marks)

Remember: Grow, Make, Serve: primary grows, secondary makes, tertiary serves.

Chapter E3: Economics 3: Money and Credit

Class X • Social Science • CBSE 2026-27

Big idea: Money solves the double coincidence of wants; cheap, fair credit, especially from formal sources, is key to development.

Key points

- **Money as a medium of exchange:** barter needs a **double coincidence of wants**; money acts as the intermediate step everyone accepts.
- Modern money: **currency** (notes and coins issued by the **RBI** for the government) and **demand deposits** (withdrawable by cheque).
- **Banks** keep about 5% of deposits as cash and lend the rest, earning interest from borrowers.
- **Credit** helps when it raises income (Salim's shoe business) but can cause a **debt-trap** when crops fail (Swapna's case).
- **Terms of credit:** **interest rate, collateral, documents and mode of repayment.**
- **Formal sources:** banks, cooperatives, supervised by **RBI**. **Informal:** moneylenders, traders, relatives; high interest, no rules.
- Rich households use cheap formal credit; poor depend on costly informal credit. Formal credit must reach **everyone** for development.
- **Self-Help Groups (SHGs):** 15–20 members, mostly women, save regularly and lend within the group; banks lend to the group without collateral.
- **Grameen Bank** (Bangladesh, **Muhammad Yunus**) lends to poor women at reasonable rates.

Formulas, definitions & facts

- **Collateral:** an asset (land, house, deposits) the borrower pledges as a guarantee.
- **Demand deposit:** bank deposit payable on demand; can be used by cheque.
- **Debt-trap:** situation where repaying a loan pushes the borrower into further debt.
- Inflation rate is **not** a term of credit.

Exam focus: how to score

- 5-mark: how SHGs help poor women (savings, collateral-free loans, group pressure, empowerment).
- Compare formal and informal credit; why formal credit must expand.
- Explain the RBI's role in supervising banks.

★ Important questions from CBSE sample papers

- Explain how SHGs help banks minimise risk when lending to poor women without collateral. (SQP 2026-27, 3 marks)
- Which of the following factors is NOT included in the terms of credit? (SQP 2026-27, 1 mark)
- 'Formal loans must be accessible to all people for national development.' Justify. (SQP 2025-26, 3 marks)
- Miss X wants to start a savoury food store in her village. How can SHGs help her? (SQP 2024-25, 5 marks)

Remember: SHG = Save, Help, Grow: small savings → group loans → no collateral needed.

Chapter E4: Economics 4: Globalisation and the Indian Economy

Class X • Social Science • CBSE 2026-27

Big idea: Board exam: 'What is globalisation?' and 'Factors that have enabled globalisation'. The rest is for the internal project.

Key points

- **MNC:** a company that owns or controls production in more than one country, usually where costs are low and markets are near.
- **Foreign investment:** investment made by MNCs. MNCs set up joint ventures, buy local firms (Cargill bought **Parakh Foods**) or place orders with small producers.
- **Ford Motors** came to India in 1995 and set up a plant near Chennai with **Mahindra and Mahindra**.
- Foreign trade and foreign investment **integrate production and markets** across countries.
- **Globalisation:** rapid integration or interconnection between countries through goods, services, investment, technology and people.
- **Factor 1: Technology:** cheaper, faster transport (**containers**); information and communication technology: telecom, computers, Internet, satellites.
- **Factor 2: Liberalisation:** removing barriers on trade and investment; India changed policy around **1991**.
- **Trade barrier:** a restriction such as a **tax on imports** or a quota.

Formulas, definitions & facts

- **Globalisation:** rapid integration or interconnection between countries.
- **Liberalisation:** removing barriers or restrictions set by the government.
- **Containers:** goods packed in standard boxes and loaded directly on ships, trains and trucks.
- **WTO:** World Trade Organisation, aims to make trade freer.

Exam focus: how to score

- 3-mark: how technology and liberalisation together sped up globalisation.
- Assertion-reason: MNCs integrate production and markets.
- Use the Delhi-printed magazine for London as an IT example.

★ Important questions from CBSE sample papers

- 'Improvements in technology and liberalisation together have accelerated globalisation.' Evaluate. (SQP 2026-27, 3 marks)
- Assertion: MNCs help integrate production and markets. Reason: they produce in one country and export to others. (SQP 2026-27, 1 mark)
- Highlight three significant factors that have contributed to the growth of globalisation. (SQP 2025-26, 3 marks)

Remember: T + L = G: Technology plus Liberalisation equals Globalisation.

Class X

English

One-page chapter summaries
Large print • CBSE 2026-27 syllabus

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- P10. For Anne Gregory (W.B. Yeats) — page 20
- S1. A Triumph of Surgery (Footprints) — page 21
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- S9. The Book That Saved the Earth (Footprints) - Play — page 29
- W1. Grammar (Section B, 10 marks) — page 30
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Code 184. 1-9 First Flight prose; P1-P10 poems; S1-S9 Footprints Without Feet; W1-W2 Grammar & Writing. Questions: official CBSE SQPs 2023-24 to 2026-27.

Chapter 1: A Letter to God (First Flight)

Class X • English • CBSE 2026-27

Big idea: Lencho's simple, unshakeable faith in God, and the quiet kindness of strangers who answer it.

Key points

- **Lencho**, a farmer, lives in the only house on the crest of a low hill; his ripe corn field needs only a downpour.
- Rain comes; he calls the big drops '**new coins**'. Then a huge **hailstorm** destroys the whole crop.
- 'A plague of locusts would have left more than this.' Yet one hope remains: **help from God**.
- He writes to God asking for **100 pesos** to resow and live until the next crop.
- The **postmaster**, a fat, amiable man, laughs, then is moved by such faith. He decides to reply.
- He collects money from employees, friends and part of his own **salary**: a little more than half, which he signs 'God'.
- Lencho counts **70 pesos**, is angry, and writes again: send the rest, but not by mail, "**the post office employees are a bunch of crooks.**"
- **Irony**: he suspects the very people who helped him.

Characters, themes & key quotes

- **Lencho**: hard-working, innocent, total faith in God; ungrateful without knowing it.
- **Postmaster**: kind, generous, did not want to shake 'the faith of a man who believed'.
- Themes: **faith vs reality**, human kindness, irony, nature as giver and destroyer.
- Hailstones = 'frozen pearls'; the field looked as if 'covered with salt'.

Exam focus: how to score

- The **hailstorm** is the turning point: it creates the crisis and tests Lencho's faith (SQP 2026-27 answer).
- Explain the **irony** of the ending: kind helpers are called crooks; God gets the credit.
- Character sketch of the postmaster: humour, compassion, sacrifice. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- How does the hailstorm function as more than just a weather event in the story? (SQP 2026-27, 3 marks)
- What does the postmaster's reaction to Lencho's letter reveal about his character? (SQP 2024-25, 3 marks)
- Explain how the devastation caused by the hailstorm reflects the sadness within Lencho. (SQP 2023-24, 3 marks)

Remember: New coins → hail → faith → 70 pesos → 'crooks'.

Chapter 2: Nelson Mandela: Long Walk to Freedom (First Flight)

Class X • English • CBSE 2026-27

Big idea: Freedom is indivisible: true freedom means freeing both the oppressed and the oppressor.

Key points

- **10 May 1994:** Mandela sworn in as South Africa's first Black President at the **Union Buildings, Pretoria**.
- Guests from many nations; it marked the first **democratic, non-racial government** after apartheid.
- He pledges: **"Never, never and never again"** shall this land see oppression of one by another.
- Jets, helicopters and troop carriers fly past; the generals who once would have arrested him now salute him.
- Two anthems: whites sing 'Nkosi Sikelel-iAfrika', blacks sing 'Die Stem'.
- He remembers heroes like **Oliver Tambo, Walter Sisulu, Chief Luthuli**: 'depths of oppression create heights of character'.
- **Twin obligations:** to family and to people/country; apartheid made fulfilling both nearly impossible.
- Childhood 'transitory freedoms' gave way to a hunger for the freedom of his people.

Characters, themes & key quotes

- "Courage was not the absence of fear, but the **triumph over it**."
- "No one is born hating another person... if they can learn to hate, they can be taught to love."
- "The oppressor must be liberated just as surely as the oppressed." A man who takes away freedom is **a prisoner of hatred**.
- "Freedom is indivisible." The country's greatest wealth is **its people**.

Exam focus: how to score

- Learn 4-5 quotes word-perfect: they lift any answer on courage, freedom or equality.
- Explain 'twin obligations' and why Mandela became a 'man of the people'.
- Apply ideas to today (SQP 2025-26 style). **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- How can Mandela's vision of 'liberating both the oppressed and the oppressor' be applied in modern-day societies to address inequality and discrimination? (SQP 2025-26, 3 marks)
- Speech on the resilience of the human spirit to transcend discrimination, linking 'Long Walk to Freedom' and 'The Trees'. (SQP 2023-24, 6 marks)

Remember: Freedom is indivisible; courage = triumph over fear.

Chapter 3: Two Stories About Flying (First Flight)

Class X • English • CBSE 2026-27

Big idea: Fear is conquered by need and courage; help can come from unexpected places.

Key points

- **I. His First Flight** (Liam O'Flaherty): a young seagull is alone on his ledge; brothers and sister flew the day before.
- Afraid of the wide sea below, he could not flap his wings; parents and siblings scolded and ignored him.
- Starving after 24 hours, he cries 'ga, ga, ga'. His **mother** flies near with a piece of **fish**, then stops just short.
- Mad with hunger, he dives at the fish, falls, then **his wings spread** and he flies. His family celebrates with him.
- **II. The Black Aeroplane**: a pilot flies an old **Dakota** from Paris to England, dreaming of breakfast.
- He chooses to fly into huge **storm clouds**; compass and radio fail; fuel runs low.
- A **black aeroplane with no lights** appears, signals 'Follow me', and guides him to a runway, then vanishes.
- Control tower: **no other plane was flying**; only his was on the radar. Mystery left unsolved.

Characters, themes & key quotes

- **Seagull**: fearful, then brave; hunger is the external catalyst; mother uses 'tough love'.
- **Pilot**: takes a risk, trusts a stranger 'like an obedient child'.
- Themes: overcoming fear, self-belief, family support, the unexplained.
- Sound words: screaming, shrieking; movement: swooped, soared, curvetting.

Exam focus: how to score

- Compare catalysts of change: seagull (hunger) vs Valli (curiosity) (SQP 2026-27 LA).
- Extracts test **imagery** and sound/movement words; 'contradict' items need text proof.
- Who was the black pilot? Give a reasoned view; there is no single 'right' answer. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Compare and contrast how the catalysts in 'Madam Rides the Bus' and 'His First Flight' drive the protagonists' change. (SQP 2026-27, 6 marks)
- Extract: contradict the view that the young seagull celebrated his maiden flight alone. (SQP 2025-26, 2 marks)
- Extract: how does the author's descriptive language enhance the narrative? (SQP 2024-25, 2 marks)
- Compare the approaches of the seagull's mother and Amanda's mother. (SQP 2023-24, 6 marks)

Remember: Hunger made the gull fly; a ghost plane led the pilot home.

Chapter 4: From the Diary of Anne Frank (First Flight)

Class X • English • CBSE 2026-27

Big idea: A lonely 13-year-old turns her diary into a trusted friend, 'Kitty'.

Key points

- Anne got the diary on her **13th birthday** (12 June 1942); later the family hid from the Nazis in Amsterdam.
- **"Paper has more patience than people."** She writes because she has **no true friend** to confide in.
- She has family, aunts and 30 'friends', but talks only of everyday things, so names her diary **Kitty**.
- Brief life sketch: born 1929 in Frankfurt; family moved to Holland in 1933; she adored her **grandmother**.
- At school, maths teacher **Mr Keesing** punishes her talking with essays: 'A Chatterbox', 'An Incurable Chatterbox'.
- She argues talking is a student's trait, inherited from her mother.
- Third essay, 'Quack, Quack, Quack, Said Mistress Chatterbox', she writes as a **funny poem**.
- Mr Keesing takes the joke well, reads it to the class, and **lets her talk** after that.

Characters, themes & key quotes

- **Anne**: witty, intelligent, sensitive, lonely, mature beyond her age.
- **Mr Keesing**: strict 'old fogey' but fair and good-humoured.
- Themes: loneliness, the need to confide, humour and creativity, adolescence.
- Kitty = the friend who will listen without judging.

Exam focus: how to score

- Why Anne calls the diary Kitty and why she gives a sketch of her life.
- How Anne wins over Mr Keesing: creative argument and humour.
- Diary entries as Anne: use her lively, honest voice. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Kitty was a trusted friend to Anne. Elaborate. (SQP 2023-24, 3 marks)
- Why does Anne want to keep a diary? (NCERT, Thinking about the Text)

Remember: No friend → Kitty; chatterbox → poem → peace with Mr Keesing.

Chapter 5: Glimpses of India (First Flight)

Class X • English • CBSE 2026-27

Big idea: Three pen-portraits of India's diversity: Goa's baker, Coorg's land and people, Assam's tea.

Key points

- **A Baker from Goa** (Lucio Rodrigues): elders recall Portuguese days and their **loaves**; the bakers still remain.
- The **jingling thud of his bamboo** woke children; they ran for **bread-bangles**. Bakers wore the **kabai**, later short pants.
- Bread is essential: **bol** for weddings, **cakes and bolinhas** for Christmas, sandwiches for engagements. Accounts in pencil on a wall.
- **Coorg** (Lokesh Abrol): between **Mysore and Mangalore**; coffee, rainforests; best season Sept-March.
- **Kodavus** may be of Greek or Arab descent; wear the **kuppia**; famous hospitality; **Coorg Regiment**; General Cariappa.
- River **Kaveri**, **Mahaseer** fish, Brahmagiri hills, Nisargadhama, Tibetan monks at **Bylakuppe**.
- **Tea from Assam** (Arup Kumar Datta): Rajvir visits friend Pranjol's tea estate, **Dhekiabari**.
- Legends: a **Chinese emperor's** boiled water and **Bodhidharma's** eyelids. **Second flush (May-July) gives the best tea.**

Characters, themes & key quotes

- Baker: happy, plump, 'jackfruit-like'; a symbol of tradition.
- Coorg: brave, independent people; Kodavus may carry firearms without a licence.
- Rajvir: curious, well-read; Pranjol: takes his home for granted.
- Themes: cultural diversity, heritage, tourism, nostalgia.

Exam focus: how to score

- Know 3-4 facts per part: SQPs ask 'justify' and 'why include' questions.
- Tea legends add cultural depth and make the story engaging (SQP 2026-27 answer).
- LA on tourism and regional culture: give one example from each part. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Why has the writer included the legends about tea's origin in 'Tea from Assam'? (SQP 2026-27, 3 marks)
- How does literature like 'The Baker from Goa', 'Coorg' and 'Tea from Assam' promote tourism and awareness of regional cultures? (SQP 2025-26, 6 marks)
- Justify that the traditional baker and his bread play a significant role in Goan society. (SQP 2023-24, 3 marks)

Remember: Bread in Goa, coffee in Coorg, tea in Assam.

Chapter 6: Mijbil the Otter (First Flight)

Class X • English • CBSE 2026-27

Big idea: A rare otter becomes a beloved, playful pet, and a lesson in caring for animals.

Key points

- After his dog **Jonnie** dies, **Gavin Maxwell** decides to keep an otter at **Camusfearna**, Scotland.
- In **Basra, Iraq (1956)** he gets a young otter, **Mijbil**, a new race: **Maxwell's otter**.
- Mij is aloof at first, then bonds with Maxwell; loves water, turns on the **bath tap** himself.
- Airline rule: an 18-inch box. Mij tears it open; blood on his face scares Maxwell.
- On the plane Mij escapes; passengers shriek ('A rat!'). A kind **air hostess** lets Maxwell hold him on his knee.
- In London, Mij plays with **ping-pong balls**, marbles and a terrapin shell, and invents games.
- Londoners guess wildly: a baby seal, a squirrel, a walrus, a hippo, a 'brontosaur'.
- A labourer asks **"Here, Mister, what is that supposed to be?"**

Characters, themes & key quotes

- **Maxwell**: patient, caring, observant, humorous narrator.
- **Mij**: playful, intelligent, loves water, needs constant activity.
- Themes: human-animal bond, responsibility of pet ownership, human ignorance about animals.
- Otters 'extend and spread' every drop of water.

Exam focus: how to score

- Otter traits: love of water, play, tap-turning, juggling games.
- Humour that entertains and critiques human arrogance (SQP 2026-27 answer).
- Ignorance of Londoners and what it shows about people. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- How does the writer use humour to entertain readers and critique societal attitudes toward animals? (SQP 2026-27, 3 marks)
- Otters have peculiar behavioural traits. Support with any two traits from 'Mijbil the Otter'. (SQP 2025-26, 3 marks)
- What does Londoners' ignorance about Mijbil reveal about people's perceptions of animals? (SQP 2024-25, 3 marks)

Remember: Mij: water-mad, tap-turner, 'what is that supposed to be?'

Chapter 7: Madam Rides the Bus (First Flight)

Class X • English • CBSE 2026-27

Big idea: An eight-year-old's first bus ride shows her the joys of the world and the reality of death.

Key points

- **Valli (Valliammai)**, 8, loves watching the street; the **bus** to town fascinates her most.
- She learns: town is **6 miles** away, fare **30 paise** each way, 45 minutes per trip.
- She saves **60 paise**, resisting peppermints, toys and even the merry-go-round.
- She slips out while her mother naps (1 to 4 pm) and boards the **1 pm bus**.
- The playful **conductor** calls her **"madam"**; she acts grown-up, refuses help and a cold drink.
- She finds an **elderly woman** repulsive and rejects her fussing; enjoys the canal, palm trees, a cow on the road.
- On the return trip she sees **the same young cow lying dead**: the memory haunts her.
- Home by 3:40; she keeps the trip a **secret** from her mother and aunt.

Characters, themes & key quotes

- **Valli**: curious, determined, independent, self-respecting, thrifty.
- **Conductor**: friendly, humorous, kind.
- Themes: **curiosity and independence**, growing up, life and death (innocence to experience).
- Cow: alive and funny on the way, dead on return = loss of innocence.

Exam focus: how to score

- Valli's planning and determination; why she refuses the drink (self-respect, no debt).
- Significance of the dead cow; 'familiar vs unfamiliar' (SQP 2024-25).
- Compare with the seagull: Valli's catalyst is **inner curiosity**. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Compare and contrast how the catalysts in 'Madam Rides the Bus' and 'His First Flight' drive the change. (SQP 2026-27, 6 marks)
- Assess how the story portrays the tension between the comfort of familiarity and the allure of the unfamiliar. (SQP 2024-25, 3 marks)

Remember: 60 paise, 'madam', a dead cow, a secret.

Chapter 8: The Sermon at Benares (First Flight)

Class X • English • CBSE 2026-27

Big idea: Death is universal; the wise accept it and do not grieve.

Key points

- **Siddhartha Gautama**, a prince, was shielded from suffering; married and had a son.
- At about **25**, out hunting, he saw a **sick man, an aged man, a funeral procession and a monk**.
- He left to seek enlightenment; after **7 days** under a tree, he was enlightened: it became the **Bodhi Tree**.
- He became the **Buddha** and gave his **first sermon at Benares**, on the Ganges.
- **Kisa Gotami**'s only son died; mad with grief, she begged everyone for medicine.
- Buddha asked for **a handful of mustard seed from a house where no one had died**.
- Every house had lost someone: 'the living are few, but the dead are many'.
- She realised death is common to all and that her grief was selfish.

Characters, themes & key quotes

- **Kisa Gotami**: grieving mother → wise woman who accepts mortality.
- **Buddha**: teaches through experience, not lecture.
- "The wise do not grieve, knowing the terms of the world."
- Weeping brings no peace; pain only grows. Mortals are like **ripe fruits** and **earthen vessels**.

Exam focus: how to score

- Why mustard seed? So she discovers the truth **herself**.
- Compare with 'For Anne Gregory': outward things are fleeting (SQP 2024-25 LA).
- Write on acceptance of loss with Buddha's quote. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Both 'For Anne Gregory' and 'The Sermon at Benares' grapple with the idea that external attributes are fleeting and subject to decay. Examine the similarities. (SQP 2024-25, 6 marks)
- What did Kisa Gotami understand the second time that she failed to understand the first time? (NCERT, Thinking about the Text)

Remember: No house without death: so the wise do not grieve.

Chapter 9: The Proposal (First Flight) - Play

Class X • English • CBSE 2026-27

Big idea: A farce: a marriage proposal collapses into silly quarrels over land and dogs.

Key points

- **Anton Chekhov's** one-act farce, set in 19th-century rural Russia.
- **Lomov** (35, nervous, hypochondriac) visits **Chubukov** in evening dress to propose to his daughter **Natalya** (25).
- Chubukov is delighted; Natalya is called in, not knowing why he came.
- Lomov's long talk of his land leads to a fight over **Oxen Meadows**: both claim it.
- They insult each other's families; Lomov leaves with palpitations.
- Natalya learns he came to propose, has hysterics: **"Bring him back!"**
- Lomov returns; they now fight over whose dog is better: **Guess** or **Squeezer**.
- Lomov collapses; Chubukov joins them; they're declared engaged, still quarrelling. 'Champagne!'

Characters, themes & key quotes

- **Lomov**: nervous, quarrelsome; marries for a 'quiet and regular life', not love.
- **Natalya**: practical, argumentative, as stubborn as Lomov.
- **Chubukov**: greedy for a good match, hypocritical: abuses Lomov, then embraces him.
- Themes: **marriage as property deal**, pride, humour, satire of the rich.

Exam focus: how to score

- Use stage directions ([excited], [aside]) to show tension and comedy (SQP 2026-27 answer).
- Character sketches and 'why it is a farce'.
- Chubukov's priorities: wealth and land over feelings. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Extract: how do stage directions like [excited] and [aside] enhance dramatic tension? (SQP 2026-27, 2 marks)
- How does Chubukov's reaction to Lomov's proposal reflect his priorities and values? (SQP 2025-26, 3 marks)
- Extract: why is Lomov's tone in "What more do I want?" uncertain and questioning? (SQP 2023-24, 2 marks)

Remember: Proposal → Meadows → dogs → engaged & still fighting.

Chapter P1: Dust of Snow (Robert Frost)

Class X • English • CBSE 2026-27

Big idea: A tiny moment in nature can lift a sad mood and save a day.

Key points

- A **crow** shakes **dust of snow** from a **hemlock tree** onto the poet.
- This small act **changes his mood** and saves part of a day he had '**rued**' (regretted).
- Crow and hemlock usually suggest gloom, death, bad omen; here they bring joy.
- Message: happiness can come from the smallest, least expected things.
- One sentence, two short stanzas, simple words with a deep meaning.
- Frost: 'a little thing touches a larger thing'.

Characters, themes & key quotes

- Theme: nature heals; positive outlook; small moments, lasting impact.
- Snow = joy/renewal; crow & hemlock = sorrow, made positive.
- Key words: hemlock (poisonous tree), rued (held in regret).

Poetic devices to spot

- **Rhyme scheme:** abab, cdcd.
- **Symbolism:** crow, hemlock, snow.
- **Enjambment:** the whole poem is one sentence.

Exam focus: how to score

- Why crow and hemlock, not a pretty bird and tree? Unexpected joy.
- Contrast with 'Fire and Ice' or link with 'The Ball Poem' (brief moments, lasting lessons). **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.
- **Extract (5 marks):** one-word / MCQ / 2-mark 'analyse' items; quote the word asked about.

★ Important questions from CBSE sample papers

- How do 'The Ball Poem' and 'Dust of Snow' propose that momentary events generate a lasting impact? (SQP 2026-27, 6 marks)
- 'Dust of Snow' and 'Fire and Ice' use contrasting elements of nature to convey their messages differently. Examine. (SQP 2024-25, 6 marks)

Remember: Crow + snow = mood saved.

Chapter P2: Fire and Ice (Robert Frost)

Class X • English • CBSE 2026-27

Big idea: Human desire (fire) and hatred (ice) can each destroy the world.

Key points

- Some say the world will end in **fire**, some in **ice**.
- Fire = **desire**: greed, lust, avarice, fury. The poet holds with fire.
- Ice = **hatred**: coldness, rigidity, indifference, intolerance.
- If the world perished twice, ice too 'is also great / And would suffice'.
- Message: our inner emotions, not just nature, can end the world.
- Short, calm, almost casual tone about a huge subject: understatement.

Characters, themes & key quotes

- Theme: destructive power of extreme emotions; need for balance.
- Key lines: "From what I've tasted of desire / I hold with those who favour fire."
- "For destruction ice / Is also great / And would suffice."

Poetic devices to spot

- **Symbolism**: fire, ice.
- **Rhyme scheme**: abaabcbcb (fire/desire, ice/twice/suffice).
- **Understatement / irony**: 'would suffice'.

Exam focus: how to score

- Explain what fire and ice symbolise with examples (greed, hatred today).
- Comment on language: simple words, irony/understatement in 'suffice'.
- **Extract (5 marks)**: one-word / MCQ / 2-mark 'analyse' items; quote the word asked about.

★ Important questions from CBSE sample papers

- Extract: when the speaker says ice could end the world, he refers to ____ as the means of destruction; comment on the poet's use of language. (SQP 2023-24, 1 + 2 marks)
- Examine how 'Dust of Snow' and 'Fire and Ice' use contrasting elements of nature differently. (SQP 2024-25, 6 marks)

Remember: Fire = desire, Ice = hate; both enough to end the world.

Chapter P3: A Tiger in the Zoo (Leslie Norris)

Class X • English • CBSE 2026-27

Big idea: A caged tiger's quiet rage shows the cruelty of taking away freedom.

Key points

- In the zoo the tiger **stalks** 'the few steps of his cage' 'on pads of velvet quiet, in his quiet rage'.
- He should be **lurking in shadow**, sliding through long grass near the **water hole** where plump deer pass.
- He should be **snarling** at the jungle's edge, baring white fangs, **terrorising the village**.
- But he is **locked in a concrete cell**, 'his strength behind bars', ignoring visitors.
- At night he hears patrolling cars and stares 'with his brilliant eyes / At the brilliant stars'.
- Structure: zoo → jungle (2 stanzas) → zoo: a **contrast**.

Characters, themes & key quotes

- Theme: freedom vs captivity; animal rights; helpless anger.
- 'Quiet rage': suppressed anger. 'Brilliant stars': his longing for freedom.
- Zoo words: few steps, concrete cell, bars. Wild words: lurking, sliding, snarling.

Poetic devices to spot

- **Alliteration**: 'pads of velvet', 'sliding... grass'.
- **Repetition**: quiet, brilliant.
- **Imagery & contrast; transferred epithet**: 'quiet rage'.
- **Rhyme**: abcb.

Exam focus: how to score

- List contrasting words for cage vs wild (common 3-mark ask).
- Effect of repetition ('quiet', 'brilliant'). Link with 'The Trees' on freedom. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.
- **Extract (5 marks)**: one-word / MCQ / 2-mark 'analyse' items; quote the word asked about.

★ Important questions from CBSE sample papers

- 'The Trees' and 'A Tiger in the Zoo' resonate the theme of freedom and the desire to break free. Examine. (SQP 2025-26, 6 marks)
- Extract: why does the poet say 'vivid' stripes; how is the contrast between confinement and inner emotion reinforced? (SQP 2024-25, 1-2 marks)
- How does Norris use vivid imagery to depict the confinement of the captive tiger? (SQP 2023-24, 3 marks)

Remember: Velvet pads, quiet rage, brilliant eyes on brilliant stars.

Chapter P4: How to Tell Wild Animals (Carolyn Wells)

Class X • English • CBSE 2026-27

Big idea: A comic 'guide' to identifying wild animals in the most dangerous way.

Key points

- **Asian Lion:** large, tawny; if he roars as 'you're dyin'.
- **Bengal Tiger:** 'noble wild beast', black stripes on yellow **ground**; notice **if he eats you**.
- **Leopard:** hide 'peppered' with spots; he will 'lep and lep again'.
- **Bear:** hugs you 'very, very hard'; 'just one more caress'.
- **Hyena** comes with merry smiles; if they **weep**, they're **Crocodiles**.
- **Chameleon:** small, no ears, no wings; if there is nothing on the tree, it's the chameleon.
- Humour comes from **irony** and **poetic licence**.

Characters, themes & key quotes

- Theme: humour; danger of wild animals; playful language.
- 'ground' = background; 'discern' = identify; 'novice' = beginner.
- Poetic licence: 'dyin'' rhymes with 'lion'; 'lept/lep'; 'A novice might nonplus'.

Poetic devices to spot

- **Irony & humour.**
- **Poetic licence:** dyin'/lion, lept, lep.
- **Rhyme scheme:** ababcc.
- **Alliteration:** 'Bengal Tiger to discern'.

Exam focus: how to score

- Find the humour in each stanza: identification comes only when it is too late.
- Why 'incorrect' spelling and grammar? For rhyme and rhythm.
- **Extract (5 marks):** one-word / MCQ / 2-mark 'analyse' items; quote the word asked about. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Extract: what does the poet imply by 'noble wild beast'; how is humour used in describing the Bengal Tiger? (SQP 2025-26, 1 + 2 marks)
- Identify the phrase in the extract that is advisory in nature. (SQP 2025-26, 1 mark)

Remember: Know the beast once it eats, hugs or weeps!

Chapter P5: The Ball Poem (John Berryman)

Class X • English • CBSE 2026-27

Big idea: Losing a ball teaches a boy the first lesson about loss and responsibility.

Key points

- A boy's ball bounces down the street into the **harbour** water.
- "No use to say 'O there are other balls'": the loss is about **memories**, not money.
- He stands rigid, trembling, 'staring down / All his young days into the harbour'.
- The poet **would not intrude**: a dime, another ball, is worthless now.
- The boy senses **first responsibility** in a 'world of possessions'.
- "Money is external": no one buys a ball back.
- He learns the **epistemology of loss**: 'how to stand up / Knowing what every man must one day know'.

Characters, themes & key quotes

- Themes: loss is universal and part of growing up; acceptance; maturity.
- Ball = childhood/innocence; harbour = the deep past.
- 'epistemology of loss' = understanding what it means to lose something.

Poetic devices to spot

- **Symbolism**: ball = childhood.
- **Repetition**: 'how to stand up'.
- **Free verse** with **enjambment**.
- **Alliteration**: 'balls, balls'.

Exam focus: how to score

- Why the poet doesn't buy a new ball: the boy must learn on his own.
- Phrase showing loss is universal: 'what every man must one day know'.
- **Extract (5 marks)**: one-word / MCQ / 2-mark 'analyse' items; quote the word asked about. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- How do 'The Ball Poem' and 'Dust of Snow' propose that momentary events generate a lasting impact? (SQP 2026-27, 6 marks)
- Extract: what does 'how to stand up' suggest about the boy's emotional growth? (SQP 2025-26, 2 marks)
- Extract: which phrase conveys the poet's idea that loss is universal? (SQP 2025-26, 1 mark)

Remember: Money is external; learn to stand up after loss.

Chapter P6: Amanda! (Robin Klein)

Class X • English • CBSE 2026-27

Big idea: A nagged child escapes into dreams of freedom.

Key points

- Alternate stanzas: a parent's **commands**, then Amanda's **daydreams** in brackets.
- Nagging: don't bite your nails, don't hunch, sit up straight, homework, room, shoes, chocolate, acne.
- Dream 1: a **mermaid** on a 'languid, emerald sea'.
- Dream 2: an **orphan** roaming the street: **"The silence is golden, the freedom is sweet."**
- Dream 3: **Rapunzel**, tranquil in her tower, who will **never let down her hair**.
- End: 'Stop that sulking... Anyone would think that I nagged at you, Amanda!' (irony).

Characters, themes & key quotes

- Theme: freedom of childhood vs constant correction; **communication gap** between parent and child.
- Amanda: imaginative, sensitive, defiant through silence.
- Speaker (mother): caring but nagging; her concern is about appearance and health.

Poetic devices to spot

- **Repetition**: 'Amanda!'.
- **Allusion**: Rapunzel.
- **Metaphor**: 'silence is golden'.
- **Alliteration**: 'soft dust'; **irony** in the last stanza.

Exam focus: how to score

- Role of **parentheses**: they mark Amanda's inner world (SQP 2024-25).
- Effect of repeating 'Amanda!' and exclamation marks: frustration, nagging tone.
- **Extract (5 marks)**: one-word / MCQ / 2-mark 'analyse' items; quote the word asked about. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Extract: analyse how repeating Amanda's name and exclamation marks shape the tone and mood. (SQP 2026-27, 2 marks)
- How does repetition in 'Amanda!' highlight the speaker's expectations and Amanda's responses? (SQP 2025-26, 3 marks)
- Summarise the role of the use of parentheses in the poem 'Amanda!'. (SQP 2024-25, 3 marks)

Remember: Mermaid, orphan, Rapunzel: all alone and free.

Chapter P7: The Trees (Adrienne Rich)

Class X • English • CBSE 2026-27

Big idea: Trees kept indoors break free to the forest: a symbol of liberation.

Key points

- Trees inside the poet's house are **moving out into the forest**, empty till now.
- In the empty forest no bird could sit, no insect hide, 'no sun bury its feet in shadow'.
- All night roots disengage from veranda cracks; leaves strain toward the glass.
- Boughs shuffle 'like **newly discharged patients**', half-dazed, to the clinic doors.
- The poet sits writing long letters, scarcely mentioning the forest's departure.
- "Listen. The glass is breaking." Trees stumble into the night; winds rush to meet them.
- 'The moon is broken like a mirror', its pieces flash in the crown of the tallest oak.

Characters, themes & key quotes

- Theme: **freedom from confinement**; nature vs human control; often read as women breaking free.
- Rich is called a feminist and radical poet.
- Breaking glass and moon = painful but necessary change.

Poetic devices to spot

- **Simile**: 'like newly discharged patients', 'broken like a mirror'.
- **Personification**: sun's 'feet', trees moving.
- **Imagery**: sound, sight, smell.
- **Free verse**.

Exam focus: how to score

- Explain imagery of movement from house to forest (SQP 2024-25).
- 'Listen' creates immediacy; 'stumbling' = unsteady, uncertain.
- Link with 'A Tiger in the Zoo' / 'Long Walk to Freedom'. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Extract: how does the sequence of sensory experiences enhance meaning and impact readers? (SQP 2026-27, 2 marks)
- 'The Trees' and 'A Tiger in the Zoo' resonate the theme of freedom. Examine. (SQP 2025-26, 6 marks)
- How does the imagery of the trees' movement reflect themes of liberation and growth? (SQP 2024-25, 3 marks)

Remember: Roots loosen, glass breaks, trees go free.

Chapter P8: Fog (Carl Sandburg)

Class X • English • CBSE 2026-27

Big idea: Fog, like a cat, arrives silently, watches, and moves on.

Key points

- "The fog comes / on little cat feet."
- It sits looking over **harbour and city** 'on silent haunches'.
- 'and then moves on': fog is **temporary**, like moments in life.
- The poet never says 'like a cat': it is an **extended metaphor**.
- Free verse: no rhyme, short lines, everyday language that breaks traditional rules.

Characters, themes & key quotes

- Theme: nature's quiet, mysterious beauty; impermanence (transient).
- Cat qualities: silent, watchful, independent, leaves when it wants.
- 'little': gentle, soft, unthreatening mood.

Poetic devices to spot

- **Extended metaphor**: fog = cat.
- **Personification**.
- **Visual imagery**.
- **Free verse**.

Exam focus: how to score

- Explain the cat metaphor with **3 cat-like actions** (comes, sits, moves on).
- 'and then moves on' = transience of life (SQP 2025-26).
- **Extract (5 marks)**: one-word / MCQ / 2-mark 'analyse' items; quote the word asked about. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- How does the poem use the 'cat metaphor' to characterise the fog's nature? (SQP 2026-27, 3 marks)
- How does the line 'and then moves on' reflect the transient nature of the fog and life's impermanence? (SQP 2025-26, 3 marks)
- Extract: significance of the word 'little'; type of imagery used. (SQP 2023-24, 2 + 1 marks)

Remember: Fog = a cat: comes, sits, moves on.

Chapter P9: The Tale of Custard the Dragon (Ogden Nash)

Class X • English • CBSE 2026-27

Big idea: The 'coward' everyone mocked turns out to be the bravest of all.

Key points

- **Belinda** lives in a little white house with **Ink** (kitten), **Blink** (mouse), **Mustard** (dog) and **Custard** (dragon).
- Custard has sharp teeth, spikes, scales, a mouth like a fireplace, but cries for 'a nice safe cage'.
- The others boast of bravery and **tease** him, calling him 'Percival'.
- A **pirate** climbs in the 'winda' with two pistols and a cutlass.
- Belinda cries 'Help!'; Mustard flees; Ink trickles down; Blink 'strategically mouseholed'.
- **Custard jumps up and gobbles the pirate.**
- The others boast again; Custard modestly agrees 'everybody is braver than me'.

Characters, themes & key quotes

- Theme: **don't judge by appearances**; true courage shows in action; humility.
- A humorous **ballad**, close to a parody.
- 'realio, trulio': coined words for rhyme and fun.

Poetic devices to spot

- **Rhyme**: aabb (couplets).
- **Simile**: 'brave as a barrel full of bears'.
- **Onomatopoeia**: Meowch, Weeck, clatter, clank.
- **Coined words / poetic licence**: realio, trulio, winda.

Exam focus: how to score

- Irony: the 'brave' ones run, the 'coward' saves them.
- Relevance today: judging people by surface traits (SQP 2026-27 answer).
- **Extract (5 marks)**: one-word / MCQ / 2-mark 'analyse' items; quote the word asked about.
3-mark SA (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Assess how the poem's message about not judging by appearances is still relevant today. (SQP 2026-27, 3 marks)
- Extract: examine the portrayal of Blink; what atmosphere do the lines create? (SQP 2024-25, 2 + 1 marks)
- How does the poem challenge the notion that individuals should conform to societal expectations? (SQP 2023-24, 3 marks)

Remember: The coward ate the pirate.

Chapter P10: For Anne Gregory (W.B. Yeats)

Class X • English • CBSE 2026-27

Big idea: Only God can love a person for herself alone, not for her looks.

Key points

- Written as a **conversation** between a young man (old man in some readings) and young **Anne**.
- He says young men, in despair at her 'great honey-coloured / Ramparts at your ear', will never love her for herself alone.
- She replies she can **dye her hair** brown, black or carrot so they love her for herself.
- He answers: an old religious man found a text proving **only God** could love her 'for yourself alone / And not your yellow hair'.
- Human love is drawn to **outer beauty**; true, unconditional love is divine.

Characters, themes & key quotes

- Theme: inner vs outer beauty; nature of human love.
- 'Ramparts' = walls of a fort: her hair is like a protective wall.
- Yeats: Irish poet, Nobel Prize 1923.

Poetic devices to spot

- **Metaphor**: hair as ramparts.
- **Dialogue form**; **rhyme**: abcbdb.
- **Repetition**: 'for yourself alone / And not your yellow hair'.

Exam focus: how to score

- Who speaks each stanza and what each believes.
- Compare with 'The Sermon at Benares': outer attributes are fleeting (SQP 2024-25). **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.
- **Extract (5 marks)**: one-word / MCQ / 2-mark 'analyse' items; quote the word asked about.

★ Important questions from CBSE sample papers

- Both 'For Anne Gregory' and 'The Sermon at Benares' grapple with the idea that external attributes are fleeting. Examine the similarities. (SQP 2024-25, 6 marks)
- What does the young man mean by 'great honey-coloured ramparts at your ear'? (NCERT, Thinking about the Poem)

Remember: Yellow hair wins men; only God loves the real you.

Chapter S1: A Triumph of Surgery (Footprints)

Class X • English • CBSE 2026-27

Big idea: Love must be sensible: over-pampering made Tricki ill; discipline cured him.

Key points

- Vet **James Herriot** is worried about **Tricki**, Mrs Pumphrey's overfed little dog.
- She feeds him cream cakes, chocolates, plus **malt, cod-liver oil and Horlicks**; no walks.
- Tricki becomes fat, listless, refuses food, vomits; Herriot sees 'a bloated sausage'.
- Herriot insists he be **hospitalised for about a fortnight**; she almost swoons.
- At the surgery: **no food for two days, only water**, then normal food and play with other dogs.
- Mrs Pumphrey sends **eggs** and **wine** to 'build him up'; the staff enjoy the gifts.
- In **two weeks** Tricki is lithe and fit. She calls it **"a triumph of surgery"**: ironic, there was no surgery.

Characters, themes & key quotes

- **Herriot**: wise, firm, kind, humorous; puts the animal's health first.
- **Mrs Pumphrey**: rich, loving but foolish, lacks self-control.
- Themes: responsible pet care, saying 'no', irony.
- Tricki: a victim of excessive love.

Exam focus: how to score

- Why the title is ironic.
- Role of the surgery: structured care vs pampering (SQP 2025-26 LA).
- Character sketch of Herriot or Mrs Pumphrey. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Comment critically on the role of the Surgery in 'A Triumph of Surgery'. (SQP 2025-26, 6 marks)
- Evaluate how James Herriot's characterisation contributes to the theme of responsible pet ownership and animal welfare. (SQP 2024-25, 6 marks)
- 'A Triumph of Surgery' is a powerful example of the importance of saying 'no'. Explain. (SQP 2023-24, 3 marks)

Remember: No food, play, two weeks: a 'surgery' without a knife.

Chapter S2: The Thief's Story (Footprints)

Class X • English • CBSE 2026-27

Big idea: Trust and kindness can reform even a thief.

Key points

- Narrator, a **15-year-old thief**, calls himself '**Hari Singh**'; he wins over **Anil**, a struggling writer.
- Anil gives him food and shelter for work and teaches him to **write his name**, promising sentences and numbers next.
- Hari cheats on shopping; Anil knows but says nothing.
- One night Anil hides a bundle of notes (sold a book) under his mattress; Hari steals it.
- He plans the 10:30 Express to Lucknow but **can't board**; he thinks of the chance to learn and be a 'big man'.
- In the rain he returns and slips the notes back under the mattress.
- Next morning Anil gives him a **fifty-rupee note, still wet**: he knows but forgives.
- Hari's smile now **comes by itself**, without effort: real change.

Characters, themes & key quotes

- **Hari**: clever, observant, flatterer at first; finally honest, wants education.
- **Anil**: easy-going, trusting, generous, forgiving.
- Theme: **values are caught, not taught**; trust and education transform people.

Exam focus: how to score

- Trace Hari's **character arc**: manipulator → reformed (SQP 2023-24 LA).
- Why Hari returned: education, Anil's trust, conscience.
- Compare first smile vs final smile (SQP 2026-27). **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Compare Hari's initial approach to Anil with his honest smile at the end. What does this change reveal? (SQP 2026-27, 3 marks)
- Evaluate the adage 'Values are caught, not taught' for Anil and Hari Singh. (SQP 2025-26, 3 marks)
- Trace the character arc of the thief in 'The Thief's Story'. (SQP 2023-24, 6 marks)

Remember: Wet note, silent trust, a smile that comes by itself.

Chapter S3: The Midnight Visitor (Footprints)

Class X • English • CBSE 2026-27

Big idea: Quick thinking beats a pistol: Ausable outwits Max with an invented balcony.

Key points

- **Ausable**, a fat secret agent with an American accent, takes young writer **Fowler** to his sixth-floor room in Paris.
- Fowler is disappointed: no romance or thrill.
- **Max**, a rival agent, waits inside with a **pistol** for a report on **new missiles**.
- Ausable calmly blames 'that nuisance of a **balcony**' under the window that Max must have used.
- A knock: Ausable says it is the **police**, coming to protect the paper.
- Max hides on the 'balcony', drops from the window and **falls** (there is no balcony).
- It was **Henry**, the waiter, with drinks. **"There is no balcony."**

Characters, themes & key quotes

- **Ausable**: calm, intelligent, quick-witted, a master storyteller.
- **Max**: smooth but overconfident and gullible.
- **Fowler**: romantic young writer, expects movie-like spies.
- Themes: presence of mind, appearance vs reality, suspense.

Exam focus: how to score

- Balcony = power of narrative / perception over reality (SQP 2026-27 LA).
- Misdirection and suspense techniques (SQP 2025-26 LA).
- Ausable vs typical secret agents. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Discuss what the non-existent 'balcony' symbolises in 'The Midnight Visitor'. (SQP 2026-27, 6 marks)
- How does the author use misdirection to enhance suspense and the unexpected ending? (SQP 2025-26, 6 marks)
- Comment on one element of Robert Arthur's writing style that creates tension and suspense. (SQP 2023-24, 3 marks)

Remember: No balcony, no police: only brains.

Chapter S4: A Question of Trust (Footprints)

Class X • English • CBSE 2026-27

Big idea: A clever thief is out-thieved; 'honour among thieves' is a myth.

Key points

- **Horace Danby**, about 50, a respectable locksmith, robs one safe a year to buy **rare books**.
- He has studied **Shotover Grange** for two weeks; about **£15,000** of jewels are in the safe.
- He wears **gloves**, calls the dog **Sherry** by name, and sneezes (hay fever, flowers).
- A young, pretty **lady in red** enters, posing as the owner's wife; threatens to call the police.
- Scared, Horace **takes off his gloves** to give her his lighter, and agrees to open the safe for her 'forgotten numbers'.
- He hands her the jewels and leaves happily.
- Arrested later: his **fingerprints** are everywhere; the real wife is a grey-haired woman of 60.
- He is now assistant librarian in prison; angry at the phrase 'honour among thieves'.

Characters, themes & key quotes

- **Horace**: meticulous planner, but vain, gullible under pressure.
- **Lady**: smart, confident, manipulative: 'in the same profession'.
- Themes: **crime doesn't pay**, trust misplaced, irony.

Exam focus: how to score

- Why gloves off: fear and desperation broke his careful routine (SQP 2026-27 answer).
- Clues that the lady was a fake; irony of the title.
- Did he deserve his punishment? **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Why does Horace take off his gloves to give the young lady his lighter? What does it show about his state of mind? (SQP 2026-27, 3 marks)
- Horace Danby was a meticulous planner but still he faltered. Where did he go wrong and why? (NCERT, Think about it)

Remember: Gloves off = fingerprints on = prison.

Chapter S5: Footprints Without Feet (Footprints)

Class X • English • CBSE 2026-27

Big idea: Science without ethics: Griffin's brilliant discovery turns him into a lawless man.

Key points

- Scientist **Griffin** swallows rare drugs and becomes **invisible**.
- His landlord tries to evict him; Griffin **sets fire** to the house and escapes naked.
- In London two boys see **muddy footprints** appearing from nowhere.
- He spends a night in a **big London store**, clothing and feeding himself.
- At a **Drury Lane** theatrical shop he gets bandages, dark glasses, false nose, whiskers; robs the shopkeeper.
- He takes two rooms at an inn in **Iping**; **Mrs Hall** finds him eccentric.
- A **clergyman** and wife hear money being taken: the room seems empty.
- Confronted, he removes his clothes; constable **Jaffers** is knocked unconscious; Griffin escapes.

Characters, themes & key quotes

- **Griffin**: brilliant, but **lawless**, bad-tempered, selfish, violent.
- **Mrs Hall**: curious, friendly, then angry.
- Themes: misuse of science, isolation, power without responsibility.
- H.G. Wells: science fiction.

Exam focus: how to score

- Character sketch of Griffin: genius + misuse (SQP 2024-25 LA).
- Incidents at the inn and the vicarage (sequence matters).
- His moments of comfort and identity (SQP 2025-26). **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Griffin experiences moments of comfort and normalcy while invisible. How do these moments impact his identity and actions? (SQP 2025-26, 3 marks)
- Evaluate how Griffin's character is shaped by ambition, the unintended consequences of his science, and society's reactions. (SQP 2024-25, 6 marks)

Remember: Invisible genius, visible crimes.

Chapter S6: The Making of a Scientist (Footprints)

Class X • English • CBSE 2026-27

Big idea: Curiosity, a first-rate mind and the will to win make a scientist.

Key points

- At **22**, **Richard Ebright** and his college room-mate publish a new theory on how cells work.
- Only child, grew up north of **Reading, Pennsylvania**; collected butterflies, rocks, fossils, coins.
- After his father died, his **mother** became his biggest support: books, trips, telescopes.
- Book: **The Travels of Monarch X**; he tags monarchs for **Dr Frederick A. Urquhart**.
- Seventh grade: **loses** a science fair (slides of frog tissue) and learns real experiments matter.
- Eighth grade: viral disease of monarchs; later proves **viceroy** butterflies copy monarchs.
- Purpose of the **12 tiny gold spots on a monarch pupa**: a hormone for full development.
- Also a debater, orator, canoeist, photographer; mentor **Richard A. Weiherer**.

Characters, themes & key quotes

- Ebright: curious, hard-working, competitive 'for the right reasons'.
- Mother: encouraging, provides 'the right tools'.
- Recipe: "Start with a **first-rate mind**, add curiosity, and mix in the will to win for the right reasons."

Exam focus: how to score

- Role of mother, book and failure in shaping him.
- Early successes as building blocks for later work (SQP 2024-25).
- Extracts on the gold-spots project. **3-mark SA** (40-50 words): Content 2 + Expression 1; accuracy errors can cost up to 1 mark.

★ Important questions from CBSE sample papers

- Justify the opinion that Ebright's early successes were essential for his later achievements in science. (SQP 2024-25, 3 marks)
- Extract: Ebright's approach to finding the purpose of the gold spots was highly effective. Elaborate. (SQP 2023-24, 2 marks)

Remember: Monarch X → gold spots → cell theory.

Chapter S7: The Necklace (Footprints)

Class X • English • CBSE 2026-27

Big idea: Vanity and pride cost Matilda ten years of hardship, for a fake necklace.

Key points

- **Matilda Loisel**, pretty but born to a clerk's family, marries a petty clerk and dreams of luxury.
- Invitation to the **Minister of Public Instruction's** ball; she weeps: no dress.
- Husband gives **400 francs** he saved for a gun; she buys a dress.
- She borrows a **diamond necklace** from friend **Mme Forestier**; shines at the ball.
- Necklace lost. They buy a replacement for **36,000 francs** (Loisel's 18,000 + loans).
- **Ten years** of poverty to repay; Matilda becomes a hard, rough woman of the poor.
- She meets Mme Forestier: **"Mine were false. They were not worth over five hundred francs!"**
- Guy de Maupassant; famous twist ending.

Characters, themes & key quotes

- **Matilda**: vain, discontented, proud; later hard-working and responsible.
- **M. Loisel**: loving, self-sacrificing, content.
- Themes: **vanity and materialism lead to downfall**, honesty, appearance vs reality, irony.

Exam focus: how to score

- Irony throughout (SQP 2026-27): suffering for a worthless necklace.
- What if she had confessed? Honesty theme (SQP 2025-26).
- Diary entry as M. Loisel / Matilda. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Analyse how the writer uses irony to convey that vanity and materialism lead to one's downfall. (SQP 2026-27, 3 marks)
- How does 'The Necklace' illustrate the significance of honesty for a happy, stress-free life? (SQP 2025-26, 3 marks)
- How does Matilda's desire for material wealth drive the plot? (SQP 2024-25, 3 marks)
- Write M. Loisel's diary entry on class, social status and social mobility. (SQP 2023-24, 6 marks)

Remember: One night of glory, ten years of debt, a fake necklace.

Chapter S8: Bholi (Footprints)

Class X • English • CBSE 2026-27

Big idea: Education and a kind teacher turn a neglected 'simpleton' into a confident woman.

Key points

- **Sulekha**, called **Bholi**, is the 4th daughter of **Numberdar Ramlal**.
- Fell off a cot at **10 months**; **smallpox** at 2 left pockmarks; she **stammers**.
- A girls' school opens; the Tehsildar asks Ramlal to set an example, so Bholi is sent.
- Parents think: no one will marry her, let the teachers worry about her.
- The kind **teacher** gently helps her say her name: **"Put the fear out of your heart."**
- Years later, **Bishamber Nath**, a lame, middle-aged grocer, agrees to marry her.
- At the wedding he sees her pockmarks and demands **Rs 5,000** dowry; Ramlal pays.
- Bholi flings the garland into the fire, speaks **without a stammer**, refuses the 'mean, greedy, contemptible coward'; she will serve her parents and teach.

Characters, themes & key quotes

- **Bholi**: neglected → confident, educated, self-respecting.
- **Teacher**: compassionate; sees Bholi as 'her masterpiece'.
- Themes: girls' education, dowry, gender bias, confidence.

Exam focus: how to score

- Bholi's main obstacle was **psychological** (fear), not physical (SQP 2026-27 answer).
- Role of education and the teacher (SQP 2023-24).
- Character sketch: before vs after. **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Extract: the teacher's words suggest Bholi's primary obstacle is psychological rather than physical. Elaborate. (SQP 2026-27, 2 marks)
- Extract: how does the author's use of Bholi's perspective help build the narrative? (SQP 2024-25, 2 marks)
- How does education play a transformative role in Bholi's life? (SQP 2023-24, 3 marks)

Remember: From 'Bh-Bh-Bholi' to 'I won't marry this coward'.

Chapter S9: The Book That Saved the Earth (Footprints) - Play

Class X • English • CBSE 2026-27

Big idea: Arrogance plus ignorance is dangerous; a nursery-rhyme book saved Earth.

Key points

- A **Historian** in the **25th century** recalls the Martian invasion of **2040**, stopped by one book.
- The 20th century was the 'Era of the Book'; then came television and computers.
- **Think-Tank**, ruler of Mars, with a huge 'brain', commands Captain Omega, Lieutenant Iota, Sergeant Oop; **Noodle** is his apprentice.
- Martians in **Centerville Public Library** think books are **sandwiches**, then hats.
- Noodle suggests books are for reading. They read **Mother Goose** rhymes and think them code.
- 'Hey Diddle Diddle' = cows jump over the moon: Earthlings seem advanced.
- **Humpty Dumpty**'s picture looks like Think-Tank; he panics, fearing a plot against him.
- He **orders Mars evacuated to Alpha Centauri**; Earth is saved.

Characters, themes & key quotes

- **Think-Tank**: arrogant, foolish, can't admit mistakes, insults others.
- **Noodle**: humble, clever, tactful; the real saviour.
- Themes: **value of books**, satire of arrogance and blind power, humour.

Exam focus: how to score

- Think-Tank's errors and their effect on leadership (SQP 2026-27 LA).
- Satirical science-fiction elements (SQP 2024-25).
- Stage directions and the Historian's role (SQP 2025-26 extract). **6-mark LA** (100-120 words): Content 3 + Expression 2 + Accuracy 1. Use 3 clear points + a link to the theme.

★ Important questions from CBSE sample papers

- Think-Tank rules with absolute authority and arrogance yet makes ridiculous mistakes. Evaluate how this impacts his leadership. (SQP 2026-27, 6 marks)
- How does 'The Book that Saved the Earth' include elements of satirical science fiction? (SQP 2024-25, 3 marks)
- Extract: how do the stage directions contribute to atmosphere and understanding of the scene? (SQP 2025-26, 2 marks)

Remember: Sandwich → hat → code → Humpty Dumpty → retreat!

Chapter W1: Grammar (Section B, 10 marks)

Class X • English • CBSE 2026-27

Big idea: Grammar is 10 easy marks: attempt any 10 of 12 one-mark items set in real-life contexts.

Key points

- **Format:** 12 items (gap filling, editing, transformation); **answer any 10**, 1 mark each.
- **Topics:** Determiners, Tenses, Modals, Subject-verb concord, Reported speech (commands/requests, statements, questions).
- Items appear inside notices, emails, reports and blogs: read the whole sentence.
- **No half marks** in grammar: spelling and exact form matter.
- **Error-correction:** write both 'Error' and 'Correction' columns.
- **Reported speech:** change tense back one step, pronouns, time words.

Rules to remember

- Determiners: **few/a few** (countable), **little/a little** (uncountable); **those** for plural.
- Concord: 'Neither... nor' → verb agrees with the nearer subject; **"Each of..." takes 'has'**.
- Modals: **must** = rule/duty; **might** = possibility; **should** = advice.
- Tenses: 'since...' → present perfect: 'has lost'.
- Reported speech: now→then, yesterday→the previous day, next week→the following week, 'Are you...?' → asked if/whether...
- Advice: Doctor: "You should..." → The doctor advised the patient to...

Exam focus: how to score

- Do the 10 surest items first; attempt all 12 if time permits.
- Copy only the answer, neatly; never rewrite the question.
- Practise with the **Words and Expressions-II** workbook (Units 1-4, 7-11).

★ Important questions from CBSE sample papers

- Each of the participants in the Science Fair **have** been given guidelines. Find the error.
Answer: have → has (SQP 2026-27, 1 mark)
- Report: Juhi asked her friend, "Are you prepared for the mathematics test next week?"
Answer: ...if she was prepared for the mathematics test the following week. (SQP 2026-27, 1 mark)
- Saira saw there was ___ food left (few / least / any / little). Answer: little (SQP 2026-27, 1 mark)
- This hill station ___ (lose) its natural beauty since I last saw it. Answer: has lost (SQP 2026-27, 1 mark)

Remember: Few for count, little for amount; 'each' takes 'has'.

Chapter W2: Writing Skills + Paper Pattern

Class X • English • CBSE 2026-27

Big idea: Two 5-mark tasks: a formal letter and an analytical paragraph, each 100-120 words.

Key points

- **Paper (80 marks, 3 hrs):** Reading 20, Writing & Grammar 20, Literature 40; plus 20 internal assessment.
- **Reading:** discursive passage (400-450 words) + case-based factual passage with chart/data (200-250 words), 10 marks each.
- **Formal letter** (Q4, 5 marks, one of two): letter of complaint/enquiry/editor/authority, **100-120 words**.
- **Letter marks:** **Format 1 + Content 2 + Organisation 1 + Accuracy 1**.
- **Format:** sender's address, date, receiver's designation & address, **subject**, salutation, body, complimentary close, name.
- **Format:** ½ mark lost if 1-2 parts missing, 0 if more than two missing.
- **Analytical paragraph** (Q5, 5 marks): on a chart, graph, map, product features or cues; 100-120 words.
- **Paragraph marks:** **Content 2 + Organisation 2 + Accuracy 1**. No title; analyse, compare and conclude; don't just describe.

Formats & structure

- Letter body: para 1 purpose ('I wish to draw your attention to...'); para 2 problems/effects; para 3 suggestions & request.
- Close: 'Yours sincerely / faithfully', name, (A concerned resident).
- Paragraph flow: introduce the data → main trends with figures → comparison → conclusion.
- Linkers: firstly, moreover, however, whereas, consequently, overall.
- Literature answers: SA 40-50 words (3 marks); LA 100-120 words (6 marks).

Exam focus: how to score

- Cover every content point in the question (issue, effects, solutions, appeal).
- Use formal tone, no contractions; stay within the word limit.
- Quote numbers from the chart; end with an overall trend or recommendation.

★ Important questions from CBSE sample papers

- Letter: As Maya Nair, write to the RWA Secretary on the need for a community centre in Green View Colony, explaining its benefits. (SQP 2026-27, 5 marks)
- Letter: As Nandan Banerjee, write to the Editor about open burning of hospital and domestic waste: health effects, scientific disposal, awareness. (SQP 2026-27, 5 marks)
- Analytical paragraph: analyse why a student study desk organiser (bamboo, adjustable shelves, anti-slip base, 5-year guarantee) is a good purchase. (SQP 2026-27, 5 marks)
- Analytical paragraph: using SWOT notes, evaluate whether Vikram should become Debate Club President. (SQP 2026-27, 5 marks)

Remember: Letter: F1-C2-O1-A1. Paragraph: C2-O2-A1.

Class X

Tamil

One-page chapter summaries
Large print • CBSE 2026-27 syllabus

1. இயல் 1 - அமுதஊற்று (மொழி) — page 2
2. இயல் 2 - உயிரின் ஓசை (இயற்கை , அறிவியல்) — page 3
3. இயல் 3 - கூட்டாஞ்சோறு (பண்பாடு) — page 4
4. இயல் 4 - மணற்கேணி (கல்வி) — page 5
5. இயல் 5 - நிலா முற்றம் (கலை , அழகியல்) — page 6
6. இயல் 6 - விதை நெல் (நாடு , சமூகம்) — page 7
7. இயல் 7 - பெருவழி (அறம் , தத்துவம்) — page 8
8. திருக்குறள் (இயல் 3, இயல் 5) — page 9
9. வாசிப்பு & படைப்பாற்றல் (பகுதி அ , உ) — page 10

Based on the CBSE Tamil (006) Class X syllabus 2026-27 (Iyal 1-7) and the prescribed SCERT Tamil Nadu Class X Tamil textbook, revised edition 2025, read from a freely available PDF copy (padasalai.info); text extraction was imperfect, so a few details rest on the long-standing Samacheer content. CBSE has not yet released a Tamil SQP for 2026-27 (link shows error), so questions come from the CBSE Tamil SQP 2025-26 (and 2024-25), kept only where the lesson is still in the 2026-27 syllabus. Lessons with no SQP question carry textbook-exercise style questions, marked as such. Page 1-7 = one page per Iyal; then Thirukkural and Reading/Writing pages.

Chapter 1: இயல் 1 - அமுதஊற்று (மொழி)

Class X • Tamil • CBSE 2026-27

Big idea: தமிழின் சொல்வளம் , தமிழன்னையின் பெருமை , கவிஞனின் மனிதம் - மொழியே நம் அடையாளம் .

Key points

- உரைநடை : பாவாணர் பார்வையில் தமிழ்ச்சொல் வளம் - நாட்டுவளமே சொல்வளத்துக்குக் காரணம் ; ஆங்கிலத்தில் leaf ஒன்றே , தமிழில் இலைக்குப் பல பெயர்கள் .
- இலை வகை : தாள் (நெல் , புல்) , இலை (புளி , வேம்பு) , தோகை (கரும்பு) , ஓலை (தென்னை , பனை) ; காய்ந்த தாள் சண்டு , காய்ந்த இலை சருகு .
- கிளை வகை : கவை → கொம்பு → கிளை → சினை → போத்து → குச்சி → இணுக்கு ; நெல் வகைகள் : செந்நெல் , வெண்ணெல் , கார்நெல் , சம்பா .
- செய்யுள் : அன்னை மொழியே - பாவலரேறு பெருஞ்சித்திரனார் (இயற்பெயர் துரை . இராசமாணிக்கம்) ; நூல் : கனிச்சாறு ; தமிழைக் குமரிக்கண்டப் பேரரசி , பத்துப்பாட்டு , எட்டுத்தொகை , சிலம்பு , மணிமேகலை என வாழ்த்துகிறார் .
- செய்யுள் : காலக்கணிதம் - கண்ணதாசன் (இயற்பெயர் முத்தையா , சிறுகூடப்பட்டி) ; ' யானோர் காலக் கணிதம் ' - கவிஞன் புகழ்ச்சிக்கு மயங்கான் , செல்வர் , பதவிக்கு அஞ்சான் ; ' மாற்றம் எனது தத்துவம் ' .
- துணைப்பாடம் : புயலிலே ஒரு தோணி - ப . சிங்காரம் ; புலம்பெயர்ந்த தமிழர் பற்றிய முதல் புதினம் ; இந்தோனேசியா - மலேசியா கடல் புயலில் தோணிப் பயணம் (கடற்கூத்து அத்தியாயம்) .
- ப . சிங்காரம் - சிங்கம்புணரி (சிவகங்கை) ; தம் சேமிப்பு ₹7.5 இலட்சத்தை மாணவர் கல்விக்கு வழங்கினார் .

Grammar - Sol (word types)

- மொழி மூவகை : தனிமொழி (கண் , படி) , தொடர்மொழி (கண்ணன் வந்தான்) , பொதுமொழி (தனித்தும் பிரிந்தும் பொருள் தருவது) .
- தொழிற்பெயர் : வினையடி + விகுதி (நட + தல் = நடத்தல்) ; எதிர்மறைத் தொழிற்பெயர் (நடவாமை , கொல்லாமை) .
- முதனிலைத் தொழிற்பெயர் : விகுதி இல்லாமல் வினைப்பகுதியே பெயராதல் (தட்டு , அடி) ; முதனிலை திரிந்த தொழிற்பெயர் (கெடு → கேடு) .
- வினையாலணையும் பெயர் : வினைமுற்று பெயராகி வேற்றுமை ஏற்பது (வந்தவர் அவர்தான் , பொறுத்தார் பூமியாவ்வார்) .

Exam focus: how to score

- அன்னை மொழியே - மனப்பாடப் பகுதி (*) ; பாடலின் பொருளுடன் 4 மதிப்பெண் விடை .
- சொல்வளம் - இலை / கிளை / நெல் வகைப் பெயர்களை எடுத்துக்காட்டுடன் எழுதினால் 5 மதிப்பெண் முழுமை .
- துணைப்பாட 10 மதிப்பெண் : முன்னுரை - கதைச் சுருக்கம் - கதைமாந்தர் - முடிவுரை என்ற அமைப்பு .
- ஆசிரியர் குறிப்பு (நூல் வெளி) MCQ வினாவாக அடிக்கடி வரும் .

★ Important questions from CBSE sample papers

- தமிழன்னையை வாழ்த்துவதற்கான காரணங்களாகப் பாவலரேறு சுட்டுவன யாவை ? (SQP 2025-26, 4 marks)
- தமிழ்மொழி பொருள்வளம் உடையது என்பதை விளக்குக . (SQP 2025-26, 5 marks)
- புயலிலே ஒரு தோணி - கதையைச் சுருக்கி எழுதுக . (SQP 2025-26, 10 marks)
- சான்று தருக : தொடர்மொழி (படித்தான் / அறம் வெல்க / கை / இசைத்தாய்) (SQP 2025-26, 1 marks)

Remember: இலை - தாள் - தோகை - ஓலை ; சண்டு - சருகு !

Chapter 2: இயல் 2 - உயிரின் ஓசை (இயற்கை , அறிவியல்)

Class X • Tamil • CBSE 2026-27

Big idea: காற்று , மேகம் , உலகத் தோற்றம் , மரம் - இயற்கையே உயிரின் ஓசை .

Key points

- உரைநடை : கேட்கிறதா என் குரல் ! - காற்றே பேசுவதாக அமைந்த கட்டுரை ; மூச்சுப்பயிற்சி வாழ்நாளை நீட்டிக்கும் என்கிறார் திருமூலர் ; ஓளவை குறள் ' வாயுதாரணை ' அதிகாரம் .
- காற்றின் பெயர்கள் : கிழக்கு - கொண்டல் , மேற்கு - கோடை , வடக்கு - வாடை , தெற்கு - தென்றல் ; பருவக்காற்று (தென்மேற்கு , வடகிழக்கு) மழை தருகிறது .
- காற்று ஆற்றல் : காற்றாலை மின்சாரம் (இந்தியாவில் தமிழ்நாடு முதலிடம் என்கிறது பாடநூல்) ; காற்று மாசு , ஓசோன் படலம் காக்க வேண்டும் .
- செய்யுள் : பரிபாடல் - கீரந்தையார் (பாடல் 2); உலகத் தோற்றம் : வெறுமை → கரு → நெருப்புப்பந்து → குளிர மழை → வெள்ளம் → உயிர் வாழ ஏற்ற பூமி (ஊழிகள்) .
- செய்யுள் : மேகம் - நாகூர் ருமி (இயற்பெயர் முகம்மது ரஃபி); மேகங்கள் மென்மையானவை , துணிச்சலானவை , கருணையுள்ளவை , அழகானவை .
- காளிதாசன் ' மேகசந்தேசம் ' - மேகத்தைத் தூதாக்கிய காவியம் ; நாகூர் ருமி நூல்கள் : நதியின் கால்கள் , ஏழாவது சுவை .
- துணைப்பாடம் : பிரம்மம் - பிரபஞ்சன் (இயற்பெயர் வைத்தியலிங்கம் , புதுச்சேரி); குடும்பம் நட்பு முருங்கை மரம் அவர்கள் வாழ்வில் பின்னிப் பிணைவது ; மரம் வளர்த்தல் = நன்றிக்கடன் .
- பிரபஞ்சன் - ' வானம் வசப்படும் ' புதினத்துக்குச் சாகித்திய அகாதெமி விருது (1995).

Grammar - Thogaanilai thodargal (9 types)

- சொற்களுக்கு இடையில் உருபு மறையாமல் வெளிப்படையாக வருவது தொகாநிலைத் தொடர் .
- எழுவாய்த்தொடர் (இனியன் கவிஞர்), விளித்தொடர் (நண்பா எழுது), வினைமுற்றுத்தொடர் (பாடினாள் கண்ணகி) .
- பெயரச்சத்தொடர் (கேட்ட பாடல்), வினையெச்சத்தொடர் (பாடி மகிழ்ந்தனர்), வேற்றுமைத்தொடர் (கட்டுரையைப் படித்தாள்) .
- இடைச்சொல் தொடர் , உரிச்சொல் தொடர் (சாலச் சிறந்தது), அடுக்குத்தொடர் (வருக வருக) .

Exam focus: how to score

- ' காற்று எவ்வாறெல்லாம் ஆற்றலாகத் திகழ்கிறது ? ' - 5 மதிப்பெண் : மூச்சு , மழை , மின்சாரம் , பாய்மரம் என 4-5 கருத்துகள் .
- திசைக் காற்றுப் பெயர்கள் பொருத்துக் MCQ- வாக வரும் .
- பரிபாடல் - அறிவியல் கருத்தை இன்றைய ' பெருவெடிப்பு ' கொள்கையுடன் ஒப்பிட்டு எழுதலாம் .
- தொகாநிலைத் தொடர் - ' இலக்கணக் குறிப்பு ' , ' சான்று தருக ' வினாக்களில் 1 மதிப்பெண் .

★ Important questions from CBSE sample papers

- காற்று எவ்வாறெல்லாம் ஆற்றலாகத் திகழ்கிறது ? (SQP 2025-26, 5 marks)
- சான்று தருக : வினைமுற்றுத் தொடர் (சென்ற போதே / நல்ல மாணவன் / படித்தான் பாரி / வாய்மையே வெல்லும்) (SQP 2025-26, 1 marks)
- இலக்கணக் குறிப்பு : யானோ அரசன் (இடைச்சொல் / வினை / உரிச்சொல் / எழுவாய்த் தொடர்) (SQP 2025-26, 1 marks)

Remember: கொண்டல் - கிழக்கு , கோடை - மேற்கு , வாடை - வடக்கு , தென்றல் - தெற்கு .

Chapter 3: இயல் 3 - கூட்டாஞ்சோறு (பண்பாடு)

Class X • Tamil • CBSE 2026-27

Big idea: விருந்தோம்பல் தமிழரின் தனிப்பண்பு ; பிள்ளைத்தமிழும் கிராம வாழ்வும் பண்பாட்டின் சுவை .

Key points

- உரைநடை : விருந்து போற்றுவதும் ! - **விருந்து = புதுமை** (தொல்காப்பியம்); அறிமுகம் இல்லாத புதியவரே விருந்தினர் ; ' மோப்பக் குழையும் அனிச்சம் ' குறள் .
- வறுமையிலும் விருந்து : விதைத் தினையைக் குத்தி விருந்தளித்த தலைவி ; வாளை , யாழைப் பணையம் வைத்த தலைவன் (புறநானூறு); ' உண்டால் அம்ம ... ' - இளம்பெருவழுதி .
- ' அல்லில் ஆயினும் விருந்து வரின் உவக்கும் ' - இரவிலும் விருந்தை வரவேற்ற பண்பு ; கண்ணகி கோவலனைப் பிரிந்ததால் விருந்தோம்ப முடியாததை எண்ணி வருந்தினாள் (சிலப்பதிகாரம்).
- செய்யுள் : காசிக்காண்டம் - அதிவீரராம பாண்டியர் (கொற்கை அரசர் , ' சீவலமாறன் '); **விருந்தோம்பலின் ஒன்பது ஒழுக்கங்கள்** : வியத்தல் , நன்மொழி கூறல் , நோக்கல் , ' வருக ' என்றல் , எழுதல் , அருகிருத்தல் , வழியனுப்பல் , முகமன் கூறல் ...
- அதிவீரராம பாண்டியரின் இன்னொரு நூல் : வெற்றிவேற்கை (நறுந்தொகை); நைடதம் , லிங்கபுராணம் .
- செய்யுள் : முத்துக்குமாரசாமி பிள்ளைத்தமிழ் - குமரகுருபரர் (17 ஆம் நூ .); வைத்தியநாதபுரி முருகனைக் குழந்தையாக்கிய **செங்கீரைப் பருவம்** (' ஆடுக செங்கீரை ').
- பிள்ளைத்தமிழ் : 10 பருவம் × 10 பாடல் = 100 ; ஆண்பால் , பெண்பால் என இருவகை ; குமரகுருபரர் நூல்கள் : மீனாட்சியம்மை பிள்ளைத்தமிழ் , நீதிநெறி விளக்கம் , சகலகலாவல்லிமாலை .
- துணைப்பாடம் : கோபல்லபுரத்து மக்கள் - கி . ராஜநாராயணன் (கி . ரா . ; இடைசெவல்); விடுதலைப் போராட்டப் பின்னணி ; 1991 சாகித்திய அகாடெமி ; ' கரிசல் இலக்கியம் ' முன்னோடி .

Grammar - Thogainilai thodargal (6 types)

- வேற்றுமைத்தொகை (தமிழ் கற்றான்), **உருபும் பயனும் உடன்தொக்க தொகை** (தேர்ப்பாகன் , எலிப்பொறி).
- வினைத்தொகை (சுடுமண் , ஊறுகாய்) - முக்காலமும் மறைந்தது ; பண்புத்தொகை (செந்தாமரை); இருபெயரொட்டுப் பண்புத்தொகை (மார்கழித் திங்கள்).
- உவமைத்தொகை (மலர்க்கை), உம்மைத்தொகை (புலி வில் கயல் , தாய் தந்தை), அன்மொழித்தொகை (சிவப்புச் சட்டை பேசினார்).

Exam focus: how to score

- ' வறுமையிலும் விருந்தோம்பினர் தமிழர் ' - புறநானூறு , நற்றிணை சான்றுகளுடன் 5 மதிப்பெண் .
- காசிக்காண்டம் - மனப்பாடப் பகுதி (*) ; ஒன்பது ஒழுக்கங்களை வரிசையாக எழுதப் பழகுக .
- தொகைநிலைத் தொடர் - ' தொகையாக்குக ' , ' சான்று தருக ' 1 மதிப்பெண் வினாக்கள் உறுதி .

★ Important questions from CBSE sample papers

- வறுமையிலும் விருந்தோம்பினர் தமிழர் - விளக்குக . (SQP 2025-26, 5 marks)
- சான்று தருக : உருபும் பயனும் உடன் தொக்கத் தொகை (வானவில் / குறள் படி / மாதவி மகள் / மலை ஏறினான்) (SQP 2025-26, 1 marks)
- எலியைப் பிடிக்கும் பொறி - உருபும் பயனும் உடன்தொக்க தொகையாக்குக . (SQP 2025-26, 1 marks)
- இலக்கணக் குறிப்பு : புலி வில் கயல் (SQP 2025-26, 1 marks)

Remember: விருந்தே புதுமை ; அனிச்சம் மோப்பக் குழையும் !

Chapter 4: இயல் 4 - மணற்கேணி (கல்வி)

Class X • Tamil • CBSE 2026-27

Big idea: மொழிபெயர்ப்பு அறிவைப் பரப்புகிறது ; கல்வியே வாழ்வை மாற்றும் புதிய நம்பிக்கை .

Key points

- உரைநடை : மொழிபெயர்ப்புக் கல்வி - மொழிகளுக்கு இடையிலான வேற்றுமையை ஒற்றுமையாக்குவது மொழிபெயர்ப்பு ; ' மொழிபெயர்த்து அதர்ப்பட யாத்தல் ' - தொல்காப்பியம் (மரபியல்) .
- சின்னமனுர்ச் செப்பேடு சங்ககாலத்திலேயே மொழிபெயர்ப்பு நடந்ததைக் காட்டுகிறது ; கம்பராமாயணம் , வில்லிபாரதம் , பெருங்கதை , சீவகசிந்தாமணி - வடமொழிக் கதைகளைத் தழுவியவை .
- ஷேக்ஸ்பியர் ஜெர்மனியில் அந்நாட்டுப் படைப்பாளர் போலக் கொண்டாடப்பட்டார் ; திருக்குறள் மொழிபெயர்ப்பால் உலகப் பொதுமறை ஆனது ; தாசூரின் கீதாஞ்சலி ஆங்கில மொழிபெயர்ப்பால் புகழ் பெற்றது .
- சாகித்திய அகாதெமி , தேசியப் புத்தக நிறுவனம் , தென்னிந்தியப் புத்தக நிறுவனம் மொழிபெயர்ப்புகளை வெளியிடுகின்றன ; 1723 இல் தரங்கம்பாடியில் டேனிஷ் நிறுவனம் மொழிபெயர்த்து அச்சிட்ட நூல் .
- செய்யுள் : திருவிளையாடற் புராணம் - பரஞ்சோதி முனிவர் (திருமறைக்காடு , 17 ஆம் நூ .); இடைக்காடனார் பிணக்குத் தீர்த்த படலம் - புலவனை அவமதித்த பாண்டியனைத் திருத்தி , கல்வியின் சிறப்பை உணர்த்துகிறார் இறைவன் .
- நூல் அமைப்பு : மதுரைக் காண்டம் , கூடற் காண்டம் , திருவாலவாய்க் காண்டம் - 3 காண்டம் , 64 படலம் .
- துணைப்பாடம் : புதிய நம்பிக்கை - கமலாலயன் (இயற்பெயர் வே . குணசேகரன்); அமெரிக்கக் கறுப்பினக் கல்வியாளர் மேரி மெக்லியோட் பெத்யூன் ; ' உனக்குப் படிக்கத் தெரியாது ' என்ற அவமானமே குப்பைமேட்டில் பள்ளி உருவாகக் காரணம் .

Grammar - Ilakkanam Pothu (Vazhu, Vazhaanilai, Vazhuvamaidhi)

- பிழையின்றிப் பேசுவது / எழுதுவது வழாநிலை ; பிழையுடன் வருவது வழு - திணை , பால் , எண் , இடம் , காலம் , வினா , விடை , மரபு என ஏழிலும் வரலாம் .
- எ . கா . வழு : ' செழியன் வந்தது ' → வழாநிலை : ' செழியன் வந்தான் ' ; ' நேற்று வருவான் ' → ' நேற்று வந்தான் ' .
- மரபு : தென்னை மரங்கள் உள்ள பகுதி - தென்னந்தோப்பு (தென்னந்தோட்டம் அன்று); குயில் கூவும் , மயில் அகவும் .
- வழுவமைதி : இலக்கணப்படி பிழையாயினும் அன்பு , மகிழ்ச்சி காரணமாக ஏற்கப்படுவது - பால் வழுவமைதி (' வாடா இராசா ' - மகளை), திணை , இட , கால , மரபு வழுவமைதி .

Exam focus: how to score

- துணைப்பாட 10 மதிப்பெண் : பெத்யூனின் இளமை - அவமானம் - உழைப்பு - பள்ளி உருவாக்கம் - இன்றைய மாணவருக்குச் செய்தி .
- மொழிபெயர்ப்பின் தேவை - 5 மதிப்பெண்ணுக்கு 5 சான்றுகள் (தொல்காப்பியம் , குறள் , கீதாஞ்சலி ...) .
- வழுவமைதி வகையை அடையாளம் காணும் MCQ அடிக்கடி வரும் .

★ Important questions from CBSE sample papers

- புதிய நம்பிக்கை - கதைச் சுருக்கத்தை எழுதுக . (SQP 2025-26, 10 marks)
- சான்று தருக : மரபு வழாநிலை (தென்னஞ்செடி / தென்னை இலை / மாவிலை / கரும்பு ஓலை) (SQP 2025-26, 1 marks)
- இலக்கணக் குறிப்பு : நிலா நிலா ஓடிவா (மரபு வழு / திணை வழு / காலவழு / மரபு வழுவமைதி) (SQP 2025-26, 1 marks)

Remember: வழு = பிழை ; வழாநிலை = சரி ; வழுவமைதி = ஏற்கப்பட்ட பிழை .

Chapter 5: இயல் 5 - நிலா முற்றம் (கலை , அழகியல்)

Class X • Tamil • CBSE 2026-27

Big idea: கலைஞரின் பன்முகத் திறன் , கம்பனின் கவிநயம் , அனுமார் ஆட்டக் கலைஞனின் பாய்ச்சல் - கலையே வாழ்வின் அழகு .

Key points

- உரைநடை : பன்முகக் கலைஞர் - கலைஞர் மு . கருணாநிதி (திருக்குவளை); எழுத்தாளர் , கவிஞர் , பேச்சாளர் , திரைக்கதையாளர் , இதழாளர் , ஆட்சியாளர் .
- திரைப்படம் : பராசக்தி , மனோகரா , பூம்புகார் ; இதழ் : முரசொலி ; நூல்கள் : குறளோவியம் , தொல்காப்பியப் பூங்கா , ரோமாபுரிப் பாண்டியன் , தென்பாண்டிச் சிங்கம் , நெஞ்சுக்கு நீதி .
- குமரியில் திருவள்ளுவர் சிலை அமைத்தார் ; தமிழுக்குச் செம்மொழி தகுதி பெற உழைத்தார் .
- செய்யுள் : கம்பராமாயணம் - கம்பர் ; ' கம்பன் இசைத்த கவியெல்லாம் நான் ' - பாரதி . பாடப்பகுதி : ஆற்றுப்படலம் , நாட்டுப்படலம் (பாலகாண்டம்) , கங்கைப்படலம் (அயோத்தியா) , கும்பகருணன் வதைப்படலம் (யுத்தகாண்டம்) .
- ஆற்றுப்படலம் : சோலை , பொய்கை , வயல் எங்கும் பாயும் சரயு ஆறு - ' உடம்பு தோறும் உயிரென உலாயது ' (உவமை) .
- கும்பகருணனை எழுப்பும் பாடல் : ' உறங்குகின்ற கும்பகன்ன ... ' - கறங்கு = காற்றாடி ; உலக்கையால் இடிப்பது போன்ற சந்தம் .
- துணைப்பாடம் : பாய்ச்சல் - சா . கந்தசாமி (மயிலாடுதுறை); அனுமார் வேடக் கலைஞனின் ஆட்டத்தில் மயங்கிய சிறுவன் அழகு ; கலைக்கு ஆட்பட்ட உள்ளம் .
- சா . கந்தசாமி : ' சாயாவனம் ' புகழ் ; ' விசாரணைக் கமிஷன் ' சாகித்திய அகாதெமி ; ' தக்கையின் மீது நான்கு கண்கள் ' தொகுப்பில் இக்கதை .

Grammar - Agapporul

- அன்பின் ஐந்திணை : குறிஞ்சி , முல்லை , மருதம் , நெய்தல் , பாலை ; ஒருதலைக் காமம் கைக்கிணை , பொருந்தாக் காமம் பெருந்திணை .
- பொருள் மூன்று : முதற்பொருள் (நிலம் , பொழுது) , கருப்பொருள் (தெய்வம் , மக்கள் , உணவு , பறவை ...) , உரிப்பொருள் (ஒழுக்கம்) .
- உரிப்பொருள் : குறிஞ்சி - புணர்தல் ; முல்லை - இருத்தல் ; மருதம் - ஊடல் ; நெய்தல் - இரங்கல் ; பாலை - பிரிதல் .
- தெய்வம் : முருகன் (குறிஞ்சி) , திருமால் (முல்லை) , இந்திரன் (மருதம்) , வருணன் (நெய்தல்) , கொற்றவை (பாலை) .

Exam focus: how to score

- கம்பராமாயணப் பாடல் பகுதியிலிருந்து 5 MCQ (நூல் , ஆசிரியர் , படலம் , சொற்பொருள் , சந்தம்) - SQP தாளில் இருமுறை வந்தது .
- பாய்ச்சல் - 10 மதிப்பெண் கதைச் சுருக்கம் ; அனுமார் ஆட்டக் காட்சியை உயிரோட்டமாக எழுதுக .
- திணை - தெய்வம் - உரிப்பொருள் அட்டவணையை மனப்பாடம் செய்க .

★ Important questions from CBSE sample papers

- ' உறங்குகின்ற கும்பகன்ன ... ' - இச்செய்யுள் இடம்பெற்ற நூல் , ஆசிரியர் , படலம் , ' கறங்கு ' பொருள் , சந்தம் (5 MCQ) (SQP 2025-26, 5 marks)
- பாய்ச்சல் சிறுகதைச் சுருக்கம் எழுதுக . (SQP 2025-26, 10 marks)
- முதுவேனில் காலத்தைப் பொழுதாக உடைய திணைகள் ____ (கோடிட்ட இடம்) (SQP 2025-26, 1 marks)

Remember: குறிஞ்சி - புணர்தல் , முல்லை - இருத்தல் , மருதம் - ஊடல் , நெய்தல் - இரங்கல் , பாலை - பிரிதல் .

Chapter 6: இயல் 6 - விதை நெல் (நாடு , சமூகம்)

Class X • Tamil • CBSE 2026-27

Big idea: போராட்ட வாழ்வு , பண்டைய வணிகச் சிறப்பு , ஆளுமைப் பெண்கள் - நாடும் சமூகமும் உயர்ந்த விதம் .

Key points

- உரைநடை : சிற்றகல் ஒளி - ம . பொ . சிவஞானம் (' சிலம்புச் செல்வர் ') தன்வரலாறு ' எனது போராட்டம் ' நூலிலிருந்து .
- வறுமையால் மூன்றாம் வகுப்பிலேயே கல்வி நின்றது ; தந்தை பாடிய அம்மானைப் பாடல்கள் வழி ' செவிச்செல்வம் ' பெற்று இலக்கிய அறிவு வளர்த்தார் .
- ம . பொ . சி : விடுதலைப் போராட்ட வீரர் ; தமிழரசுக் கழகம் தொடங்கியவர் ; சட்டமன்ற மேலவைத் தலைவர் (1978-86); ' வள்ளலார் கண்ட ஒருமைப்பாடு ' - 1966 சாகித்திய அகாதெமி .
- செய்யுள் : சிலப்பதிகாரம் - இளங்கோவடிகள் (சேர மரபு); மருவூர்ப்பாக்கத்து வணிகச் சிறப்பு ; 3 காண்டம் , 30 காதை ; மணிமேகலையுடன் இரட்டைக் காப்பியம் .
- செய்யுள் : முத்தொள்ளாயிரம் - வெண்பா நூல் , ஆசிரியர் பெயர் தெரியவில்லை ; 900 பாடல்களில் புறத்திரட்டு வழி 108 மட்டுமே கிடைத்துள்ளன .
- சேரநாடு - அச்சமில்லாத நாடு ; சோழநாடு - ஏர்க்களச் சிறப்பும் போர்க்களச் சிறப்பும் ; பாண்டியநாடு - முத்துடை நாடு .
- துணைப்பாடம் : மங்கையராய்ப் பிறப்பதற்கே - ஆளுமைப் பெண்கள் : எம் . எஸ் . சுப்புலட்சுமி (ஐ . நா . அவையில் பாடியவர்), பாலசரசுவதி (பரதநாட்டியம்), ராஜம் கிருஷ்ணன் (எழுத்தாளர்), கிருஷ்ணம்மாள் ஜெகந்நாதன் , சின்னப்பிள்ளை (மகளிர் சுய உதவிக்குழு) .

Grammar - Purapporul (thinaigal)

- வெட்சி - ஆநிரை கவர்தல் ; கரந்தை - ஆநிரை மீட்டல் ; வஞ்சி - மண்ணாசைப் போர் ; காஞ்சி - எதிர்த்துப் போரிடல் .
- நொச்சி - மதில் காத்தல் ; உழிஞை - மதில் வளைத்தல் ; தும்பை - நேருக்கு நேர் போர் ; வாகை - வெற்றி .
- பாடாண் - பாடுதற்குரிய ஆண்மகனின் சிறப்பு ; பொதுவியல் ; கைக்கிளை , பெருந்திணை - புறத்திலும் உண்டு .

Exam focus: how to score

- சிலப்பதிகாரம் , முத்தொள்ளாயிரம் - மனப்பாடப் பகுதிகள் (*) ; நூல் வெளிச் செய்திகள் MCQ வினாக்களுக்கு .
- மங்கையராய்ப் பிறப்பதற்கே - 10 மதிப்பெண்ணில் குறைந்தது 3 ஆளுமைகளை அவர்தம் சாதனையுடன் எழுதுக .
- புறத்திணை - பூ / செயல் பொருத்துக வினா எளிதாக முழு மதிப்பெண் தரும் .

★ Important questions from CBSE sample papers

- சேர , சோழ , பாண்டிய நாட்டு வளங்களை முத்தொள்ளாயிரம் வழி விளக்குக . (Textbook exercise, சிறுவினா)
- பாசவர் , வாசவர் , பல்நிண விலைஞர் , உமணர் - சிலப்பதிகாரம் காட்டும் இவ்வணிகர்கள் யாவர் ? (Textbook exercise, குறுவினா)
- வறுமையிலும் படிப்பின்மீது நாட்டம் கொண்டவர் ம . பொ . சி . என்பதற்குச் சான்று தருக . (Textbook exercise, குறுவினா)

Remember: சேரன் - அச்சமில்லை ; சோழன் - ஏரும் போரும் ; பாண்டியன் - முத்து .

Chapter 7: இயல் 7 - பெருவழி (அறம் , தத்துவம்)

Class X • Tamil • CBSE 2026-27

Big idea: சங்க அறம் , இரக்கம் , சிறு அக்கறை , இராமானுசரின் பொதுநலம் - அறமே பெருவழி .

Key points

- உரைநடை : சங்க இலக்கியத்தில் அறம் - சங்ககால அறங்கள் சமயம் சாராதவை ; மானிட அறம் ; பிற்கால அறநெறிக்கால அறங்கள் சமயம் சார்ந்தவை .
- மனிதன் சமூகக் கடலின் ஒரு துளி - எல்லாரோடும் இணையும் அளவுக்கு மகிழ்ச்சி பெருகும் ; பொருள் ஈட்டி அறம் செய்து இன்புற்றனர் , பழி தரும் செயல் மறுத்தனர் .
- செய்யுள் : தேம்பாவணி - வீரமாமுனிவர் (கான்ஸ்டான்டைன் ஜோசப் பெஸ்கி); கருணையன் தாய் எலிசபெத் இறந்தபோது இயற்கையும் இரங்கி அழுதது .
- தேம்பாவணி = தேம்பா + அணி (வாடாத மாலை) / தேன் + பா + அணி ; பாட்டுடைத் தலைவன் சூசையப்பர் (யோசேப்பு); 3 காண்டம் , 36 படலம் , 3615 பாடல்கள் ; 17 ஆம் நூ .
- வீரமாமுனிவர் : தமிழின் முதல் அகராதி சதுரகராதி , இலக்கண நூல் தொன்னூல் விளக்கம் .
- செய்யுள் : அக்கறை - கல்யாண்ஜி (வண்ணதாசன் , இயற்பெயர் கல்யாணசுந்தரம்); சைக்கிளிலிருந்து சரிந்த தக்காளிக் கூடை - யாரும் உதவாமல் கடந்ததால் பழங்களைவிட நசுங்கியது மனிதர்மீதான அக்கறை ; 2016 சாகித்திய அகாதெமி .
- துணைப்பாடம் : இராமானுசர் (நாடகம்) - திருக்கோட்டியூர் நம்பியிடம் பலமுறை சென்று திருமந்திரம் பெற்றார் ; தமக்கு நரகம் வந்தாலும் அனைவரும் உய்யட்டும் என மந்திரத்தைப் பொதுமக்களுக்கு அறிவித்தார் (கூரேசர் , முதலியாண்டான்) .

Grammar - Paavagai and Alagiduthal

- யாப்பு உறுப்புகள் ஆறு : எழுத்து , அசை , சீர் , தளை , அடி , தொடை .
- ஓசை : வெண்பா - செப்பல் ; ஆசிரியப்பா - அகவல் ; கலிப்பா - துள்ளல் ; வஞ்சிப்பா - தூங்கல் .
- வெண்பா வகை ஐந்து : குறள் , சிந்தியல் , நேரிசை , இன்னிசை , பஃறொடை ; திருக்குறள் , நாலடியார் - வெண்பா .
- அலகிடுதல் : சீரை நேர் , நிரை அசைகளாகப் பிரித்து வாய்பாடு (தேமா , புளிமா , கூவிளம் ...) கூறுதல் ; சிலப்பதிகாரம் , மணிமேகலை - அகவல்பா .

Exam focus: how to score

- தேம்பாவணி - மனப்பாடப் பகுதி (*) ; பெயர்க்காரணம் 2 மதிப்பெண் .
- இராமானுசர் நாடகம் - 10 மதிப்பெண் : காட்சி வாரியாக நிகழ்வுகள் , இராமானுசரின் பொதுநலப் பண்பு .
- அக்கறை - கவிதையின் மையக் கருத்து + இன்றைய வாழ்வியல் ஒப்பீடு 4 மதிப்பெண் .
- பா வகை - ஓசைப் பொருத்தம் MCQ உறுதி .

★ Important questions from CBSE sample papers

- கருணையனின் தாய் மறைவுக்கு வீரமாமுனிவர் உவமைகளாலும் உருவகங்களாலும் நிகழ்த்திய கவிதாஞ்சலியை விவரிக்க . (Textbook exercise, நெடுவினா)
- கிடைப்பதற்கரிய திருமந்திரம் கிடைத்தவுடன் இராமானுசர் செய்த நிகழ்வுகளைத் தொகுத்து எழுதுக . (Textbook exercise, நெடுவினா)
- பழங்களைவிட நசுங்கிப்போனதாகக் கல்யாண்ஜி எதைக் குறிப்பிடுகிறார் ? (Textbook exercise, குறுவினா)
- குறள்வெண்பாவின் இலக்கணத்தை எழுதி எடுத்துக்காட்டுத் தருக . (Textbook exercise, குறுவினா)

Remember: செப்பல் - அகவல் - துள்ளல் - தூங்கல் : வெண் - ஆசிரியம் - கலி - வஞ்சி .

Chapter 8: திருக்குறள் (இயல் 3, இயல் 5)

Class X • Tamil • CBSE 2026-27

Big idea: ' திருக்குறள் நிரப்புக ' - 3×1 மதிப்பெண் உறுதி ; பொருளுடன் படித்தால் 4 மதிப்பெண் செய்யுள் வினாவுக்கும் உதவும் .

Key points

- திருவள்ளுவர் - பொய்யில் புலவர் , செந்நாப்போதார் , முதற்பாவலர் , பெருநாவலர் ; காலம் சுமார் 2000 ஆண்டுகளுக்கு முன் .
- முப்பால் : அறம் (38), பொருள் (70), இன்பம் (25) = **133** அதிகாரம் , **1330** குறள் .
- இயல் 3 அதிகாரங்கள் : ஒழுக்கமுடைமை , மெய்யுணர்தல் , பெரியாரைத் துணைக்கோடல் , கொடுங்கோன்மை , ஆள்வினை உடைமை .
- ' ஒழுக்கம் விழுப்பம் தரலான் ஒழுக்கம் உயிரினும் ஓம்பப் படும் ' .
- ' எப்பொருள் எத்தன்மைத் தாயினும் அப்பொருள் மெய்ப்பொருள் காண்ப தறிவு ' .
- ' நாள்தோறும் நாடி முறைசெய்யா மன்னவன் நாள்தோறும் நாடு கெடும் ' (கொடுங்கோன்மை) .
- இயல் 5 அதிகாரங்கள் : அமைச்சு , பொருள்செயல் வகை , கூடாநட்பு , பகைமாட்சி , குடிசெயல் வகை , நல்குரவு ...
- ' குற்றம் இலனாய்க் குடிசெய்து வாழ்வானைச் சுற்றமாச் சுற்றும் உலகு ' ; ' இன்மையின் இன்னாத தியாதெனின் இன்மையின் இன்மையே இன்னா தது ' .

Figures of speech (Ani) in the Kurals

- ' குன்றேறி யானைப்போர் கண்டற்றால் ...' - உவமை அணி .
- ' பொருளல் லவரைப் பொருளாகச் செய்யும் ...' - சொல் பின்வருநிலை அணி .
- ' இன்மையின் இன்னாத ...' - சொற்பொருள் பின்வருநிலை அணி .
- ' தொழுதகை யுள்ளும் படையொடுங்கும் ...' - உவமை அணி .

Exam focus: how to score

- விடுபட்ட சொல் பெரும்பாலும் ஈற்றுச் சீர் அல்லது முதலடியின் இறுதிச் சீர் - குறளை முழுமையாக மனப்பாடம் செய்க .
- நட்சத்திரக் குறியிட்ட (*) குறள்கள் மனப்பாடப் பகுதி - முன்னுரிமை கொடுங்கள் .
- ' முயற்சியின் சிறப்பு ' - ஆள்வினை உடைமைக் குறள்களுடன் 4 மதிப்பெண் விடை .

★ Important questions from CBSE sample papers

- எப்பொருள் எத்தன்மைத் தாயினும் அப்பொருள் / மெய்ப்பொருள் ____ தறிவு (அறிவு / உணர்வு / காண்ப / தெரிவு) (SQP 2025-26, 1 marks)
- நாள்தோறும் நாடி முறைசெய்யா ____ / நாள்தோறும் நாடு கெடும் (வேந்தன் / மன்னவன் / அரசன் / மக்கள்) (SQP 2025-26, 1 marks)
- குற்றம் இலனாய்க் குடிசெய்து ____ / சுற்றமாய்ச் சுற்றும் உலகு (SQP 2025-26, 1 marks)
- முயற்சியின் சிறப்பு குறித்துத் திருக்குறள் மொழிவன யாவை ? (SQP 2025-26, 4 marks)

Remember: $133 \times 10 = 1330$; அறம் 38, பொருள் 70, இன்பம் 25.

Chapter 9: வாசிப்பு & படைப்பாற்றல் (பகுதி அ , உ)

Class X • Tamil • CBSE 2026-27

Big idea: பகுதி அ (10) + பகுதி உ (17) = 27 மதிப்பெண் - பாடநூலைச் சாராமல் பயிற்சியால் உறுதியாகப் பெறலாம் .

Key points

- உரைநடைப் பகுதி 1 : 5 MCQ ; பகுதி 2 : 5 சிறுவினா (மொழி , இலக்கியம் , வரலாறு , அறிவியல் தலைப்புகள்).
- வினாவின் சொற்களைப் பத்தியில் தேடி , அதே வாக்கியத்திலிருந்து விடை எடுங்கள் ; முழு வாக்கியமாக எழுதுங்கள் .
- கடிதம் (8) - முறைசார் (விண்ணப்பம் , முறையீடு) அல்லது உறவுமுறை ; SQP தரும் முகவரியையே பயன்படுத்துக .
- முறைசார் அமைப்பு : அனுப்புநர் → பெறுநர் → **பொருள் : ...** → மதிப்பிற்குரிய ஐயா → செய்தி → நன்றி → இப்படிக்கு , கையொப்பம் → இடம் , நாள் → உறைமேல் முகவரி .
- உறவுமுறை அமைப்பு : இடம் , நாள் → அன்புள்ள நண்பனுக்கு → நலம் விசாரிப்பு → செய்தி → இப்படிக்கு உன் அன்பு நண்பன் → உறைமேல் முகவரி .
- கட்டுரை (6) - கொடுக்கப்பட்ட குறிப்புகளையே தலைப்புகளாக்குக : முன்னுரை - உட்தலைப்புகள் - முடிவுரை ; ஒரு குறள் / பழமொழி சேர்த்தால் சிறப்பு .
- காட்சி விளக்கம் (3) - படத்தைக் கண்டு கவினுற 4-5 வரிகள் ; பார்வைத்திறன் குறைந்தோர்க்குப் பழமொழியைத் தொடரில் அமைத்தல் .

Useful phrases

- விண்ணப்பம் : '... சான்றிதழ் வழங்குமாறு பணிவுடன் கேட்டுக்கொள்கிறேன் .'
- முறையீடு : '... விரைந்து நடவடிக்கை எடுக்குமாறு வேண்டுகிறேன் .'
- இணைப்பு : ' இத்துடன் ... நகலை இணைத்துள்ளேன் .'
- முடிவுரை : '... என்பதை உணர்ந்து செயல்படுவோம் .'

Exam focus: how to score

- கடிதத்தில் வடிவத்துக்கே பாதி மதிப்பெண் - உறைமேல் முகவரியை மறக்க வேண்டாம் .
- கட்டுரையில் குறிப்புகள் அனைத்தையும் தொட வேண்டும் ; 6 மதிப்பெண்ணுக்கு ஒரு பக்கம் போதும் .
- உரைநடைப் பகுதியை முதலில் வினாக்களைப் படித்தபின் வாசியுங்கள் - நேரம் மிச்சம் .

★ Important questions from CBSE sample papers

- வருமானச் சான்றிதழ் வேண்டி வட்டாட்சியருக்கு விண்ணப்பக் கடிதம் எழுதுக . (SQP 2025-26, 8 marks)
- மனவளத்தை வளர்த்துக் கொள்ளும் முறை குறித்து நண்பனுக்குக் கடிதம் எழுதுக . (SQP 2025-26, 8 marks)
- கட்டுரை : முன்னுரை - தகவல் ஊடகங்கள் - ஊடக வகைகள் - நன்மைகள் - எதிர்மறை விளைவுகள் - முடிவுரை (SQP 2025-26, 6 marks)
- பழமொழியைத் தொடரில் அமைத்து எழுதுக : எருது புண் காக்கை அறியுமா ? / ஏட்டுச் சுரைக்காய் கறிக்கு உதவாது . (SQP 2025-26, 3 marks)

Remember: பொருள் வரி + உறைமேல் முகவரி = முழு மதிப்பெண் கடிதம் !

Class X

Artificial Intelligence

One-page chapter summaries
Large print • CBSE 2026-27 syllabus

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Based on the CBSE AI (417) Class X curriculum 2026-27 and the CBSE AI Facilitator Handbook Class X (Curriculum26 edition, which the marking scheme cites as 'CBSE Study material'). CBSE has not yet posted the 2026-27 skill-subject SQPs, so the questions come from the latest AI SQP and marking scheme (2025-26) and a few from 2024-25. Units 4 and 7 are assessed by practicals only, so their questions come from CBSE's suggested practical list. Theory paper: 50 marks (Part A 10, Part B 40); practical and project: 50.

Chapter 1: Revisiting AI Project Cycle & Ethical Frameworks for AI

Class X • Artificial Intelligence • CBSE 2026-27

Big idea: Every AI project follows a 6-stage cycle, works in one of 3 data domains, and must be checked against an ethical framework so it causes no unintended harm.

Key points

- **AI Project Cycle (6 stages): Problem Scoping → Data Acquisition → Data Exploration → Modelling → Evaluation → Deployment.**
- **Problem scoping** sets the goal; **data acquisition** collects data from reliable, authentic sources; **data exploration** visualises it (graphs, flowcharts, maps) to see patterns.
- **Modelling** picks and tests models; **evaluation** tests on new data; **deployment** puts the solution into real-world use.
- Three AI domains by type of data: **Statistical Data** (price-comparison sites), **Computer Vision** (crop monitoring, surveillance), **NLP** (email filters, machine translation).
- **Framework** = set of steps giving step-by-step guidance to solve problems. **Ethical framework** = helps ensure our choices do not cause unintended harm.
- Why needed: AI is a decision-making tool, so it must make morally acceptable choices (e.g. a hiring algorithm biased against women).
- My Goodness activity: hidden factors that shape decisions, e.g. identity or **location** of recipient, bias towards relatives.
- Types: **Sector-based** (e.g. **Bioethics** in healthcare) and **Value-based**: rights-based, utility-based, virtue-based.

Key terms & facts

- **Rights-based**: protects human rights and dignity, values human life above all.
- **Utility-based**: maximise overall good for the greatest number.
- **Virtue-based**: character and intentions of decision-makers (honesty, compassion, integrity).
- **4 principles of Bioethics: Respect for Autonomy, Do not harm, Ensure maximum benefit for all, Give justice.**
- Training data must be unbiased, or AI repeats social biases (racism, sexism).

Exam focus: how to score

- Write stages in correct order; 2-mark answers need one line of explanation per stage.
- Case studies (4 marks): name 2 reasons for bias, then 2 bioethics principles and how each applies.
- Assertion-Reason MCQs often test the value-based frameworks.
- Match an example to its domain (CV / NLP / Statistical Data).

★ Important questions from CBSE sample papers

- With respect to the type of data fed into the AI model, AI models can be broadly classified into ____ domains. [Three] (SQP 2025-26, 1 mark)
- What do you do in the second and third stages of an AI Project Cycle? (SQP 2025-26, 2 marks)
- A school AI shortlists scholarship students by how fast they fill forms online. (a) Two reasons the results were biased. (b) Two bioethics principles that solve it. (SQP 2025-26, 4 marks)
- A self-driving car fails to detect pedestrians at night. Which AI domain should be improved? [Computer Vision] (SQP 2025-26, 1 mark)

Remember: Scope → Acquire → Explore → Model → Evaluate → Deploy; Bioethics = Autonomy, No harm, Max benefit, Justice.

Chapter 2: Advanced Concepts of Modeling in AI

Class X • Artificial Intelligence • CBSE 2026-27

Big idea: AI is the umbrella, ML learns from data, DL learns from huge data with neural networks; models are rule-based or learning-based.

Key points

- **AI $\supset$ ML $\supset$ DL**. **ML**: machines improve with experience (object classification, anomaly detection). **DL**: trains itself on vast data (object identification, digit recognition).
- **Rule-based**: developer gives rules, so the model is static and cannot adapt to new data.
Learning-based: machine learns rules from data and adapts.
- **Supervised learning**: labelled data. Subtypes: **Classification** (discrete classes) and **Regression** (continuous values).
- **Unsupervised learning**: unlabelled data, finds hidden patterns. **Clustering** (group similar items, e.g. customer groups) and **Association** (bread $\rightarrow$ butter).
- **Reinforcement learning**: learns by trial and error from rewards. Useful when the environment is large, unforeseen or changing and data is scarce.
- **ANN**: modelled on the human brain, extracts features automatically; each node acts like a small ML algorithm.
- **CNN**: deep learning model that takes images and assigns importance (weights, biases) to features to tell objects apart.
- Neural network layers: **input layer** $\rightarrow$ **hidden layer(s)** (computation using weights and biases) $\rightarrow$ **output layer**; weights are adjusted using the error.

Key terms & formulas

- **Data** = information in any form. **Features** = columns (name, colour, size). **Label** = the feature we predict.
- **Labelled data** has a tag; **unlabelled data** is raw.
- **Training set**: examples the model learns from. **Testing set**: checks accuracy of the trained model.
- **Perceptron**: $y = w_1x_1 + w_2x_2 + \dots + w_nx_n + b$ (**bias**) (asked only as MCQ).

Exam focus: how to score

- Scenario $\rightarrow$ name the ML/DL application (anomaly detection, object classification, object identification, digit recognition).
- Know which learning type uses labelled vs unlabelled data; give one example each.
- Perceptron MCQ: multiply each input by its weight, add them, then add the bias.
- Features vs labels, training vs testing statements (true/false).

★ Important questions from CBSE sample papers

- A rule-based essay grader fails when students use new words. Most likely reason? [Rule-based approach is static, cannot adapt] (SQP 2025-26, 1 mark)
- Identify the deep learning model: (a) assigns weights and biases to image features (b) inspired by the human brain, each node a small ML algorithm. [CNN; ANN] (SQP 2025-26, 2 marks)
- How is reinforcement learning different from supervised and unsupervised learning? (SQP 2025-26, 2 marks)
- (a) Name the model that finds hidden patterns in unlabelled data. (b) Its two categories. (c) Explain each with an example. (SQP 2025-26, 4 marks)

Remember: Supervised = teacher with answers; Unsupervised = find groups yourself; Reinforcement = learn from rewards.

Chapter 3: Evaluating Models

Class X • Artificial Intelligence • CBSE 2026-27

Big idea: Evaluation uses metrics on unseen test data to show how well a model works, so we can keep improving it until it is reliable.

Key points

- **Model evaluation:** using metrics to understand a model's performance, strengths and weaknesses. It is a feedback loop: build → feedback → improve.
- **Train-test split:** divide the dataset into a training set (to learn) and a testing set (to predict and compare). Used for supervised learning when the data is large enough.
- Do not evaluate on training data: the model memorises it → **overfitting** and an over-optimistic accuracy.
- **Error** = difference between the prediction and the actual value. Goal: minimise error, maximise accuracy.
- **Confusion matrix:** TP, TN, FP (predicted positive, actually negative), FN (predicted negative, actually positive).
- Accuracy misleads on unbalanced data (a model that always says 'Yes' on 900 Yes / 100 No still scores 90%).
- Use **Precision** when FPs are costly (satellite launch on a bad-weather day). Use **Recall** when FNs are costly (fraud, COVID detection).
- Ethical concerns in evaluation: **Bias, Transparency, Accuracy.**

Formulas

- $\text{Error} = |\text{Actual} - \text{Predicted}|$; $\text{Error rate} = \text{Error} \div \text{Actual}$; $\text{Accuracy} = 1 - \text{Error rate}$
- **$\text{Accuracy} = (\text{TP} + \text{TN}) \div (\text{TP} + \text{TN} + \text{FP} + \text{FN})$**
- **$\text{Precision} = \text{TP} \div (\text{TP} + \text{FP})$**
- **$\text{Recall} = \text{TP} \div (\text{TP} + \text{FN})$** (also called sensitivity or true positive rate)
- $\text{F1 Score} = 2 \times \text{Precision} \times \text{Recall} \div (\text{Precision} + \text{Recall})$
- $\text{Wrong predictions} = \text{FP} + \text{FN}$

Exam focus: how to score

- Draw the confusion matrix with Reality vs Prediction labelled (½ mark per cell).
- Always write the formula first: ½ mark for the formula, ½ for the answer.
- Choose the metric from the costlier mistake: FP costly → precision; FN costly → recall; unsure → F1.
- Error-rate MCQs: divide by the actual value, not the predicted value.

★ Important questions from CBSE sample papers

- 1000 emails, 300 spam; 240 spam caught, 60 legitimate marked spam. Precision? [0.80] (SQP 2025-26, 1 mark)
- House predicted ₹4,53,000, actual ₹4,88,000. Error rate (3 d.p.)? [0.071] (SQP 2025-26, 1 mark)
- What is model evaluation, and how does it help improve an AI model? (SQP 2025-26, 2 marks)
- Pass/fail model: TP 40, TN 30, FP 20, FN 10. (a) Confusion matrix (b) Accuracy (c) Wrong predictions. [70%; 30] (SQP 2025-26, 4 marks)

Remember: Precision watches false alarms; Recall watches misses.

Chapter 4: Statistical Data (practical unit)

Class X • Artificial Intelligence • CBSE 2026-27

Big idea: Statistical Data is the data-science domain; no-code tools such as Orange let you run a full AI project by drag-and-drop.

Key points

- Assessed through **practicals** only (no theory marks in the 2026-27 scheme), but needed for the practical exam, project and viva.
- **Data science** unifies statistics, data analysis and ML. Uses: internet search, targeted advertising, website recommendations, genetics & genomics.
- Three ways to build: **High code** (write everything, e.g. Python; costly, fully customisable), **Low code** (visual tools plus some code), **No code** (drag-and-drop, no coding).
- **No-code AI**: build ML models in seconds without coding knowledge; cheap and simple but less customisable.
- No-code tools: **Orange Data Mining**, Lobe, Teachable Machine; MS Excel for statistical analysis.
- Use case: **Palmer Penguins** – predict penguin species with Orange, following the AI project cycle (explore → model → evaluate).
- Key statistics: **mean, median, mode** (central tendency), plus spread of the data; graphs for exploration.

Practical programs to know

- Mean, median and mode with NumPy: `np.mean()`, `np.median()`; mode with `statistics.mode()`
- Line chart (2,5) to (9,10): `plt.plot([2,9],[5,10]); plt.show()`
- Scatter chart: `plt.scatter(x, y)` for (2,5),(9,10),(8,3),(5,7),(6,18)
- Read a CSV: `df = pd.read_csv('file.csv');` `df.head(10); df.info()`

Exam focus: how to score

- Practical file: at least 15 programs (15 marks). Practical exam covers Units 4–7 (15 marks).
- Viva: be ready to explain no-code vs low-code vs high code with one tool each.
- Project option 1: Statistical Data – prediction of Palmer penguin species.

★ Important questions from CBSE sample papers

- Write a program to calculate mean, median and mode using NumPy. (CBSE curriculum 2026-27, suggested practical)
- Read a CSV file saved in your system and display 10 rows. (CBSE curriculum 2026-27, suggested practical)
- Write a program to display a scatter chart for the points (2,5), (9,10), (8,3), (5,7), (6,18). (CBSE curriculum 2026-27, suggested practical)

Remember: High code = write it all; Low code = some code; No code = drag & drop (Orange).

Chapter 5: Computer Vision

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Big idea: Computer Vision lets machines get information from pixels: images are grids of numbers that CNNs turn into decisions.

Key points

- **CV:** machine acquires, screens and analyses visual information, then predicts or decides. **Image processing** (resizing, brightness, tone) is a subset of CV.
- Applications: facial recognition (attendance, security), **face filters** (Instagram, Snapchat), Google search by image, CV in retail (inventory), self-driving cars, medical imaging, Google Translate camera.
- CV tasks: **Classification** (one label per image), **Classification + Localisation** (what and where, single object), **Object Detection** (finds instances of objects; image retrieval, auto parking), **Instance Segmentation** (labels every pixel).
- **Pixel** = picture element, the smallest unit of an image. **Resolution** = number of pixels, e.g. $1280 \times 1024 = 1,310,720 \approx 1.31$ megapixels.
- **Byte image:** each pixel stored in 8 bits $\rightarrow$ values 0–255 (0 = black/no colour, 255 = white/full colour).
- **Grayscale:** one plane, 1 byte per pixel, size = height $\times$ width. **RGB:** three planes (R, G, B), each pixel has 3 values.
- **Convolution:** slide a **kernel** (matrix) over the image, multiply and add $\rightarrow$ feature map (edges, blur, sharpen).
- **CNN layers: Convolution $\rightarrow$ ReLU $\rightarrow$ Pooling $\rightarrow$ Fully Connected**

CNN layer by layer

- **Convolution layer:** extracts features such as edges; output is the **feature map**.
- **ReLU:** turns negative values into 0 and adds non-linearity.
- **Pooling:** shrinks the feature map and keeps key features. **Max pooling** keeps the largest value, **average pooling** the mean.
- **Fully connected layer:** flattens the features and classifies the image (gives a probability for each label).

Exam focus: how to score

- Picture-based MCQs: identify the CV application or task from a photo.
- Byte-image answer (2 marks): 8 bits = 1 byte $\rightarrow$ 256 values (0–255); link it to binary.
- Know the order of CNN layers and one job for each.
- No-code CV in practicals: Lobe, Teachable Machine (smart sorter), Orange coral-bleaching case.

★ Important questions from CBSE sample papers

- ____ enhances raw images (rescaling, brightness, tone); it is a subset of _____. [Image Processing; Computer Vision] (SQP 2025-26, 1 mark)
- 1280×1024 , 1920×1080 , 640×480 describe an image's _____. [Resolution] (SQP 2025-26, 1 mark)
- Identifying and locating real-world objects (faces, bicycles) in images or videos, used in automated parking, is _____. [Object Detection] (SQP 2025-26, 1 mark)
- What is a 'byte image' format in the context of digital images? (SQP 2025-26, 2 marks)
- Explain the term resolution with an example. (SQP 2024-25, 2 marks)

Remember: 0 = black, 255 = white; Conv $\rightarrow$ ReLU $\rightarrow$ Pool $\rightarrow$ FC.

Chapter 6: Natural Language Processing

Class X • Artificial Intelligence • CBSE 2026-27

Big idea: NLP lets computers read and understand human language by cleaning text, then turning words into numbers (Bag of Words, TF-IDF).

Key points

- Natural language is hard for machines: the same word has **different meanings in context**, and sentences can be correct in grammar yet make no sense.
- Applications: voice assistants, **auto-generated captions**, language translation, sentiment analysis, text classification, keyword extraction.
- **Stages: Lexical analysis → Syntactic analysis (parsing) → Semantic analysis → Discourse integration → Pragmatic analysis.**
- **Syntactic:** checks grammar and word arrangement ('We are to the zoo going' fails). **Semantic:** checks meaning. **Pragmatic:** checks real-world relevance.
- **Chatbots: script bot** (pre-written rules, easy, free, limited) vs **smart bot** (AI-based, flexible, learns, needs data). Examples: Elizabot, Mitsuku, Cleverbot.
- **Text normalisation:** sentence segmentation → **tokenisation** → remove stop words, special characters and numbers → common (lower) case → stemming / lemmatisation.
- **Stemming** cuts affixes (word may lose meaning: flies → fli); **lemmatisation gives a meaningful word (flies → fly).**
- **Bag of Words:** normalise → make a dictionary of unique words → a document vector for each document (counts). Word order does not matter.

Formulas & definitions

- **Corpus** = all the text documents together. **Token** = each word, number or punctuation mark.
- **Stop words** (a, an, the, and, is) occur often but add little meaning.
- TF = frequency of a word in one document; DF = number of documents that contain it
- **$TFIDF(W) = TF(W) \times \log(IDF(W))$, where $IDF(W) = \text{total documents} \div DF(W)$**
- High TF-IDF = frequent in this document but rare in the corpus → a valuable word. Uses: document classification, topic modelling, information retrieval, stop-word filtering.

Exam focus: how to score

- BoW 4-mark question: list the vocabulary, write the vector row, explain feature extraction, and say why order is ignored.
- Identify the NLP stage from a pair of sentences (syntactic vs semantic).
- Token counting: punctuation marks count as tokens.
- Script bot vs smart bot: 2–3 differences in a table.

★ Important questions from CBSE sample papers

- Which bot works on pre-written instructions, is mostly free and has limited functionality? [Script bot] (SQP 2025-26, 1 mark)
- Stemmed and lemmatised forms of 'flies'? [fli; fly] (SQP 2025-26, 1 mark)
- Identify the NLP stage: 'We are to the zoo going tomorrow' vs 'We are going to the zoo tomorrow.' [Syntactic analysis] (SQP 2025-26, 2 marks)
- Three documents on AI: (a) make the dictionary (b) document vector for Doc 3 (c) how BoW helps feature extraction (d) why word order is ignored. (SQP 2025-26, 4 marks)
- Can we face challenges teaching computers human languages? Explain. (SQP 2024-25, 4 marks)

Remember: Lexical → Syntax → Semantic → Discourse → Pragmatic; stem chops, lemma keeps meaning.

Chapter 7: Advance Python (practical unit)

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Big idea: Python is the tool for AI practicals: Jupyter Notebook, core syntax, and libraries such as NumPy, Pandas, Matplotlib and OpenCV.

Key points

- Assessed through **practicals** only; together with Units 4–6 it makes up the 15-mark practical exam and the 5-mark viva.
- **Jupyter Notebook**: web-based tool for running Python in cells; part of the **Anaconda** distribution.
- **Virtual environment**: a separate workspace with its own packages; install packages with **pip install** (or conda).
- Basics recap: variables, data types (int, float, str, list, tuple, dict), operators, input() / print().
- Control structures: **if-elif-else**, **for** and **while** loops; lists and list operations.
- Libraries: **NumPy** (arrays, statistics), **Pandas** (CSV and DataFrames), **Matplotlib** (charts), **OpenCV** (images).

Practical programs (CBSE list)

- Add two lists element-wise: `[a+b for a,b in zip(L1, L2)]`
- Line chart from (2,5) to (9,10): `plt.plot([2,9],[5,10])`
- Read CSV and show info: `df=pd.read_csv('data.csv');` `df.info()`
- Read and show an image: `img=cv2.imread('a.jpg');` `plt.imshow(img)`
- Image shape: `print(img.shape)` → (height, width, channels)

Exam focus: how to score

- The practical file must have at least 15 programs (15 marks); keep the output with each program.
- Viva: what NumPy, Pandas and Matplotlib are for; what `img.shape` returns.
- Project or portfolio (10 marks + 5 viva): link it to an SDG, e.g. sentiment analysis or coral bleaching.

★ Important questions from CBSE sample papers

- Write a program to add the elements of two lists. (CBSE curriculum 2026-27, suggested practical)
- Write a program to display a line chart from (2,5) to (9,10). (CBSE curriculum 2026-27, suggested practical)
- Write a program to read an image and identify its shape using Python. (CBSE curriculum 2026-27, suggested practical)

Remember: NumPy = numbers, Pandas = tables, Matplotlib = charts, OpenCV = images.

Chapter A: Part A: Employability Skills (Units 1-5)

Class X • Artificial Intelligence • CBSE 2026-27

Big idea: 10 easy marks: Section A has 6 MCQs (answer any 4) and Section B has 5 short answers (answer any 3).

Key points

- **Communication Skills-II:** verbal, non-verbal and visual communication. Non-verbal includes facial expression, posture, **gesture** (raising a hand, pointing) and eye contact.
- Parts of speech: a **pronoun** replaces a noun (Kavita bought a book. **She**...). Best practices: be clear and concise, listen actively.
- **Self-Management Skills-II:** responsibility, self-awareness, time management, adaptability. To manage emotions, observe your behaviour, meditate, think rationally; don't decide on emotion alone.
- **Self-motivation steps: find your strengths → set and focus on goals → make a plan → stay loyal to your goals.**
- **ICT Skills-II:** file management (hover = show details without clicking). Data leaks when we share details on unsafe sites or leave a computer logged in. A Trojan horse is malware disguised as useful software.
- **Entrepreneurial Skills-II:** an entrepreneur makes decisions, manages the business, takes risks. Career stages: Enter → Survive → **Grow** (e.g. opening new branches).
- **Green Skills-II:** sustainable development and the 17 SDGs. Donating unused items → **SDG 12** (responsible consumption).
- **Organic farming** uses no chemical pesticides or fertilisers, giving chemical-free crops and keeping the soil fertile.

Exam focus: how to score

- 2-mark answers: 20-30 words, two clear points (1 mark each), or a definition plus an example.
- Case-based MCQs: read the behaviour, then match the skill (e.g. responsibility).
- Revise the NCERT Employability Skills Class X book; the marking scheme cites its pages.

★ Important questions from CBSE sample papers

- Raising a hand to greet or pointing a finger is which non-verbal communication? [Gesture] (SQP 2025-26, 1 mark)
- What is a pronoun? Give an example. (SQP 2025-26, 2 marks)
- List four steps to build self-motivation. (SQP 2025-26, 2 marks)
- Reema decides what soaps to make and assigns tasks to staff. Name two functions of an entrepreneur shown. [Making decisions; managing the business] (SQP 2025-26, 2 marks)
- What is organic farming? Mention any two benefits. (SQP 2025-26, 2 marks)

Remember: Strengths → Goals → Plan → Stay loyal.