

CLASS 11

PHYSICS

REVISION NOTES

Class 11 Physics Chapter 1 Units and Measurements – Quick Revision Notes

Quick-revision bullet list for Class 11 Physics Chapter 2, Units and Measurements. Pair this with the full NCERT Solutions and the HOTS Extra Questions for exam prep. These Class 11 Physics Chapter 1 notes are ideal for quick revision just before exams.

Contents

Units and Measurements: Revision Notes

Class 11 Physics Chapter 1 – Solutions and Important Questions

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Units and Measurements: Revision Notes

SI base units (7): metre (m, length), kilogram (kg, mass), second (s, time), ampere (A, current), kelvin (K, temperature), mole (mol, amount of substance), candela (cd, luminous intensity).

Supplementary/derived angle units: radian (rad, plane angle), steradian (sr, solid angle) — both dimensionless.

Rules for significant figures: all non-zero digits are significant; zeros between non-zero digits are significant; leading zeros are never significant; trailing zeros after a decimal point are significant; trailing zeros in a number without a decimal point are ambiguous unless scientific notation is used.

Rounding off: if the digit to be dropped is >5 , round up; if <5 , round down; if exactly 5, round to make the preceding digit even.

Multiplication/division rule: result has as many significant figures as the operand with the FEWEST significant figures.

Addition/subtraction rule: result has as many decimal places as the operand with the FEWEST decimal places.

Types of errors: systematic (instrumental, personal, imperfection in technique — can be corrected for) vs random (unpredictable fluctuations — reduced by averaging over many readings).

Absolute error: $\Delta a_i = |a_{\text{mean}} - a_i|$. **Mean absolute error:** average of all Δa_i .

Relative (fractional) error = mean absolute error / mean value. **Percentage error** = relative error $\times 100$.

Combination of errors — sum/difference: $Z = A \pm B \Rightarrow \Delta Z = \Delta A + \Delta B$ (absolute errors always add, even for a difference).

Combination of errors — product/quotient: $Z = AB$ or $A/B \Rightarrow \Delta Z/Z = \Delta A/A + \Delta B/B$ (relative errors add).

Combination of errors — power: $Z = A^n \Rightarrow \Delta Z/Z = n(\Delta A/A)$ (the exponent multiplies the relative error).

Dimensional formula: expresses a quantity in powers of [M],[L],[T] etc; e.g. Force = $[M L T^{-2}]$, Energy = $[M L^2 T^{-2}]$, Pressure = $[M L^{-1} T^{-2}]$.

Principle of homogeneity: every term on both sides of a valid physical equation must have the same dimensions; this is used to check correctness and derive relationships between quantities (but cannot fix missing dimensionless constants).

Uses of dimensional analysis: (1) check dimensional consistency of an equation, (2) convert units between systems, (3) derive relations among physical quantities (up to a dimensionless

constant).

Limitations of dimensional analysis: cannot determine dimensionless constants; fails for equations involving trigonometric, exponential or logarithmic functions of dimensional quantities; cannot distinguish between quantities with the same dimensional formula (e.g. torque vs energy).

Parsec: 1 pc = distance at which 1 AU subtends 1 arcsecond $\approx 3.086 \times 10^{16}$ m ≈ 3.26 light-years.

Light year: distance light travels in 1 year $\approx 9.46 \times 10^{15}$ m.

Parallax method: distance = baseline / parallax angle (in radians) — used to measure distances to nearby stars using Earth's orbital diameter as baseline.

Vernier caliper least count = 1 main scale division – 1 vernier scale division. **Screw gauge least count** = pitch / number of circular scale divisions.

Class 11 Physics Chapter 1 – Solutions and Important Questions

Need full answers or more practice? See the [Class 11 Physics Chapter 1 Solutions](#) and [Class 11 Physics Chapter 1 Extra Questions](#).