A+ PREMIUM · SPM · ENGLISH (DLP)

Last Week Before SPM

2 pages per subject · 5 subjects

- ⭐ Top things to remember
- 📐 Formula sheet
- ⚠️ 10 most common mistakes
- 🧪 Bio · Chem · Phys · Maths · Add Maths



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Biology: Top Things to Remember

⭐ Top things to remember

1. Draw and label cell organelles: animal cells have centrioles; plant cells have a cell wall, chloroplasts and a large vacuole.
2. Mitosis gives 2 identical diploid cells (growth, repair); meiosis gives 4 different haploid gametes (crossing over in prophase I).
3. Enzymes are proteins: specific active site, denatured above the optimum temperature or away from the optimum pH.
4. Diffusion and osmosis are passive; active transport needs ATP and carrier proteins and goes against the gradient.
5. Photosynthesis: light stage (thylakoid, photolysis of water, O_2 released) then dark stage (stroma, CO_2 fixed into glucose).
6. Aerobic respiration gives 2898 kJ per glucose; anaerobic in muscle gives lactic acid (oxygen debt), in yeast gives ethanol + CO_2.
7. Blood path: heart → artery → arteriole → capillary → venule → vein → heart. Double circulation: pulmonary + systemic.
8. Homeostasis is negative feedback: a change is detected, corrected, then returns to the set point (blood glucose, temperature, osmoregulation).
9. Nephron: ultrafiltration (glomerulus), reabsorption (PCT, loop, DCT), secretion. ADH makes the collecting duct more permeable.
10. Genetics: draw a full genetic diagram — parents, gametes (in circles), F1 genotype, phenotype, ratio.
11. Ecosystem: energy flows (only ~10% passes on), nutrients cycle. Use quadrats for plants, capture–mark–release for animals.
12. Always answer "explain" questions with a cause → effect chain: "...so..., therefore...".

📐 Formula sheet

- Magnification = image size ÷ actual size
- Population = (1st catch × 2nd catch) ÷ marked in 2nd catch
- Rate of reaction = 1 ÷ time
- Cardiac output = stroke volume × heart rate
- Percentage change in mass = (final − initial) ÷ initial × 100%
- $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 2898\ kJ$
- $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$ (light, chlorophyll)
- Monohybrid cross Tt × Tt → 3 : 1 phenotype ratio
- Dihybrid cross TtRr × TtRr → 9 : 3 : 3 : 1

Chemistry: 10 Most Common Mistakes

1. ❌ "Ionic compounds conduct electricity when solid."
✅ Only when MOLTEN or in water — the ions must be free to move.

2. ❌ Using 24 dm^3 for a liquid or solid.
✅ Molar volume is for GASES only.

3. ❌ "Catalysts increase the energy of particles."
✅ A catalyst gives another pathway with LOWER activation energy.

4. ❌ Forgetting to balance before using the mole ratio.
✅ Balance first; the coefficients ARE the mole ratio.

5. ❌ "The anode is always positive in a chemical cell."
✅ In a chemical (voltaic) cell the anode is NEGATIVE; in electrolysis it is positive.

6. ❌ "Strong acid = concentrated acid."
✅ Strong = fully ionises. Concentrated = lots of acid per dm^3. Different ideas.

7. ❌ Writing "gas given off" with no test.
✅ Give the test: H_2 pop, O_2 relights a glowing splint, CO_2 limewater chalky.

8. ❌ "Alkenes and alkanes both decolourise bromine water."
✅ Only ALKENES (C=C) decolourise bromine water quickly.

9. ❌ Mixing up oxidising and reducing agent.
✅ The oxidising agent is itself REDUCED (gains electrons).

10. ❌ Leaving out units and state symbols.
✅ Write mol dm^{-3}, g mol^{-1}, kJ mol^{-1} and (s), (l), (g), (aq).

Physics: Top Things to Remember

⭐ Top things to remember

1. Base quantities: length, mass, time, current, temperature (+ amount, luminous intensity). Know SI units and prefixes.
2. Graphs: gradient of s–t = velocity; gradient of v–t = acceleration; area under v–t = displacement.
3. Newton: F = ma; momentum is conserved in collisions and explosions when no external force acts.
4. Pressure in liquids depends on depth and density, not shape. Pascal (hydraulics), Archimedes (floating), Bernoulli (lift).
5. Heat: specific heat capacity changes temperature; latent heat changes state at constant temperature.
6. Gas laws need temperature in KELVIN: T(K) = θ(°C) + 273.
7. Waves: $v = f\lambda$. Reflection, refraction, diffraction, interference. Sound needs a medium; light does not.
8. Lenses: convex (real image beyond F), concave (always virtual, upright, smaller). Draw rays with a ruler.
9. Electricity: series — same current, voltages add; parallel — same voltage, currents add.
10. Electromagnetism: Fleming's left hand (motor), right hand (generator). Faraday + Lenz for induced e.m.f.
11. Electronics/quantum: thermionic emission, photoelectric effect ($E = hf$), half-life graphs.
12. In "explain" questions name the PRINCIPLE first, then apply it to the situation.

📐 Formula sheet

- $v = u + at$ · $s = ut + \frac{1}{2}at^2$ · $v^2 = u^2 + 2as$
- $p = mv$ · $F = ma$ · $Ft = mv - mu$
- $W = mg$ · $Ek = \frac{1}{2}mv^2$ · $Ep = mgh$
- $P = F \div A$ · $P = h\rho g$
- $Q = mc\theta$ · $Q = mL$
- pV = constant, p/T = constant, V/T = constant
- $v = f\lambda$ · $n = \sin i \div \sin r$ · $n = 1 \div \sin c$
- $1/f = 1/u + 1/v$ · $m = v/u$
- $V = IR$ · $P = VI = I^2R$ · $E = Pt$
- $Vs/Vp = Ns/Np$ · $E = hf$ · $E = mc^2$

Mathematics: 10 Most Common Mistakes

1. ❌ "$(x + 3)^2 = x^2 + 9$."
✅ $(x + 3)^2 = x^2 + 6x + 9$.

2. ❌ "$1101_2 = 1101_{10}$."
✅ Convert: $1(8) + 1(4) + 0(2) + 1(1) = 13_{10}$.

3. ❌ Dashed line for ≤.
✅ ≤ and ≥ use a SOLID line; < and > use a dashed line.

4. ❌ Adding probabilities of events that can happen together.
✅ Subtract the overlap: $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.

5. ❌ "AB = BA for matrices."
✅ Matrix multiplication is not commutative; order matters.

6. ❌ Standard deviation with $\Sigma x^2 \div n$ only.
✅ $\sigma = \sqrt{(\Sigma x^2/n - \bar{x}^2)}$: subtract the mean squared, then take the root.

7. ❌ Distance on a distance–time graph read as speed.
✅ Speed is the GRADIENT of a distance–time graph.

8. ❌ Forgetting the converse is not always true.
✅ "If p then q" being true does not make "if q then p" true.

9. ❌ Mixing up compound interest periods.
✅ n = number of times per YEAR, t = number of years.

10. ❌ Rounding too early.
✅ Keep full calculator values until the final answer.

Additional Mathematics: Top Things to Remember

⭐ Top things to remember

1. Functions: $fg(x) = f(g(x))$; f^{-1} by swapping x and y; only one-to-one functions have inverses.
2. Quadratics: $b^2 - 4ac$ decides the roots; complete the square for the turning point.
3. Indices/logs: same base, then equate powers; change of base for different bases.
4. Progressions: T_n, S_n for AP and GP; $S\infty$ only when $|r| < 1$.
5. Linear law: reduce to $Y = mX + c$; read m and c from the best-fit line.
6. Coordinate geometry: divisor formula, area by shoelace, parallel $m_1 = m_2$, perpendicular $m_1m_2 = -1$.
7. Vectors: $\overrightarrow{AB} = \overrightarrow{OB} - \overrightarrow{OA}$; parallel means $a = kb$.
8. Triangles: sine rule (side + opposite angle), cosine rule (angle between two sides), area $\frac{1}{2}ab \sin C$.
9. Calculus: d/dx and $\int$ rules; turning points at $dy/dx = 0$; area and volume by integration.
10. Permutation (order matters) vs combination (order does not).
11. Binomial: $P(X = r) = {}^nC_r\, p^r q^{n-r}$; Normal: $Z = (X - \mu)/\sigma$.
12. Kinematics: $s \to v \to a$ by differentiating; back by integrating; total distance needs $v = 0$ check.

📐 Formula sheet

- $b^2 - 4ac > 0, = 0, < 0$
- $\alpha + \beta = -b/a$, $\alpha\beta = c/a$
- $\log_a b = \log b \div \log a$
- AP: $T_n = a + (n - 1)d$, $S_n = n/2[2a + (n - 1)d]$
- GP: $T_n = ar^{n-1}$, $S\infty = a/(1 - r)$
- $a^2 = b^2 + c^2 - 2bc \cos A$
- $s = r\theta$, $A = \frac{1}{2}r^2\theta$
- $d/dx\,(ax + b)^n = na(ax + b)^{n-1}$
- $\int ax^n\, dx = ax^{n+1}/(n + 1) + c$
- ${}^nP_r = n!/(n - r)!$, ${}^nC_r = n!/[r!(n - r)!]$

Suka sampel ini?

Nota SPM Sains & Matematik

Set DLP English (5 subjek + bonus)

- Nota Tingkatan 4 dan 5 untuk subjek yang dipilih
- Fizik: modul PhysiXplosion T4 + Magnatron T5 dengan skema jawapan
- Set DLP: nota infografik Biology, Chemistry, Physics, Maths, Add Maths + 150 soalan ramalan DLP

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