2025 TERM 1 PHYSICAL SCIENCES ATP & LESSON PLANNER THE ANSWER SERIES

GR 12

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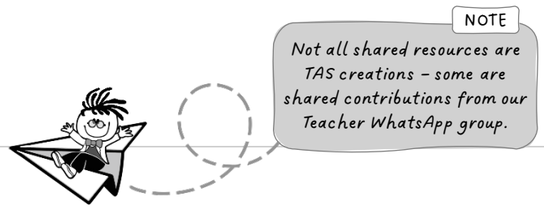
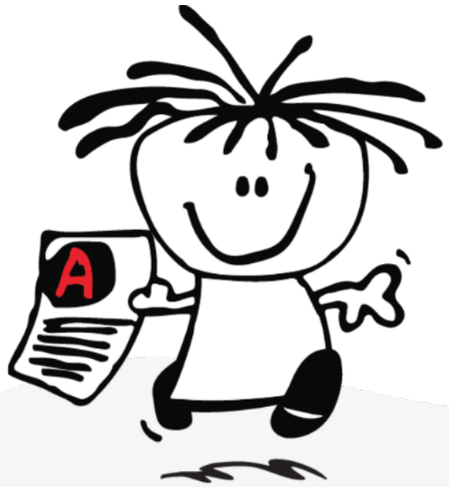
ACADEMIC WEEKS	CAPS TOPIC	CORE CONTENT & PAGE NUMBERS *Based on TAS Gr 12 PS 3-in-1 Class Text & Study Guide*		SUGGESTED EXERCISES *From TAS Gr 12 PS Class Text & Study Guide*	POSSIBLE PRACTICAL TASKS / CONSOLIDATION	DATE COMPLETED
WEEK 1 *15 – 17 Jan*	**MECHANICS** *18 school days* PAPER 1: 63 marks	**Momentum and Impulse:** What is momentum?	p. 17 – 18	**p. 22:** Q1 & Q2	- Formal Practical: Conservation of linear momentum -Example practical and memo	
		Vector nature of momentum	p. 18	**p. 22:** Q1.2 & Q3.2	Summary on Impulse and Momentum here	
		Newton II and the relationship between F_{net} and Δp	p. 19			
		Calculating Δp and F_{net} for different types of motion	p. 19 – 21	**p. 22:** Q3 & Q4 **p. 63, 64:** Q9 – Q12		
		What is impulse?				
		Impulse-Momentum theorem	p. 22 – 24	**p. 26:** Q1 & Q2 **p. 35:** Q1.1 & Q1.2 **p. 63, 64:** Q9 – Q12		
		Practical *(safety)* application of the impulse-p theorem	p. 24 – 26	**p. 26:** Q2.4	Watch the first 3 min 22 s of this video on impulse & momentum	
WEEK 2 *20 – 24 Jan*		Conservation of Momentum: Important terms	p. 26	**p. 30:** Q1		
		Law of Conservation of linear Momentum	p. 27	**p. 30:** Q2, Q3 & Q4.2 **p. 64:** Q13 – Q15, Q17.1 & Q18	- Watch this video on conservation of momentum - Simulations on conservation of momentum here & here	
		Elastic and inelastic collisions	p. 27 – 28	**p. 30:** Q4 **p. 64:** Q16 – Q18		
		Application: collision of two objects along same straight line	p. 28 – 30		- Conservation of momentum during collisions sims: here & here	
WEEK 3 *27 – 31 Jan*		**Vertical projectile motion:** Description of projectile motion Equations of motion	p. 31 – 32	**p. 35:** Q1.3 & Q1.4 **p. 36:** Q2 & Q3 **p. 25, 26:** Q19 – Q29	Formal Practical (Gr 11 p. 1.26 – 1.27): Determine the acceleration due to gravity	
		Representation of 3 different types of projectile motion	p. 33 – 35		Summary on Vertical Projectile Motion here	
		Revision of graphs; Graphs of motion for vertical motion: - position (y) - time (Δt) graph - velocity (v) - time (Δt) graph - acceleration (a) - time (Δt) graph Give equations for the y-Δt, v-Δt graphs	p. 36 – 39	**p. 41:** Q1 & Q2 **p. 65, 66:** Q20.4, Q23.2, Q25.4, Q27.1 & Q29.5		
WEEK 4 *3 – 7 Feb*		*Take note:* use y-Δt and v-Δt graphs to: - determine y, Δy, v, a - describe motion of a projectile in words	p. 38 – 41	**p. 41:** Q2 **p. 66:** Q28		
		Bouncing ball: graphs, calculations, descriptions	p. 41 – 44	**p. 43, 44:** Q1; **p. 66, 67:** Q30		
WEEK 5 *10 – 14 Feb*	**MATTER & MATERIALS** *25 school days* PAPER 2: 48 marks	**Organic Chemistry:** The origin of organic compounds; the carbon C-atom (C)	p. 70 – 71		Summary on Organic Chemistry here	
		Some homologous series and their functional groups	p. 71 – 72			
		Hydrocarbons: Saturated and unsaturated	p. 72			
		The different homologous series: formula and names of alkanes, alkenes, haloalkanes, alcohols, aldehydes, ketones, carboxylic acids, esters	p. 73 – 80	**p. 84:** Q1.3 – Q1.5, Q2.3 – Q2.5 **p. 85:** Q3 & Q4 **p. 126:** Q1, Q3 & Q4.1 **p. 127:** Q7.1 & Q8	- Formal Practical p. 94 – 95: Preparation of 3 esters - Preparation of esters: PRAC TEST & MEMO	

WEEK 6 *17 – 21 Feb*	**MATTER & MATERIALS** **(cont.)** *25 school days* PAPER 2: 48 marks	Nomenclature rules for hydrocarbons (and other homologous series): Steps *(apply to max **one functional** group, **two haloalkane** functional groups and **three alkyl** (methyl and ethyl) groups)*	*p. 81 – 88*	***p. 84:** Q1.1, Q1.2, Q2.1 & Q2.2* **p. 85:** Q1 & Q2 **p. 86:** Q1 & Q2 **p. 88:** Q1 & Q2; **p. 126:** Q1, Q2 & Q4.2	Use this tool to draw organic structures	
		Test for saturated and unsaturated hydrocarbons	p. 101	**p. 130:** Q21	Watch this video on addition reactions of alkenes; compare reactions: alkene + Br_2 **vs** alkane + Br_2 (p.101)	
		Isomers: Chain, Positional, Functional	p. 80 – 81	**p. 84:** Q1.6 **p. 88:** Q1.5 & Q2.1.2; **p. 127:** Q5, Q6 & Q7.2		
		Classification of physical properties	p. 88			
WEEK 7 *24 – 28 Feb*		Intermolecular forces (revision Gr 11)	p. 88 – 89		Watch this video on intermolecular forces Gr 11	
		Factors determining physical properties	p. 88 – 93	**p. 92, 93:** Q1 & Q2 **p. 130:** Q22 – Q24	Summary on Physical Properties of organic molecules here	
		Combustion (oxidation) reactions		**p. 129:** Q16		
		Esterification	p. 93 – 94	**p. 88:** Q1.3, Q2.2 **p. 126:** Q4.3 **p. 129**: Q18, Q19		
		Addition, elimination, substitution reactions: equations and reaction conditions; Addition reactions *(of alkenes)*	p. 94 – 95	**p. 103:** Q1 – Q4 **p. 127 – 129:** Q7.3, Q7.4, Q8.9, Q9 – Q15, Q20		
WEEK 8 *3 – 7 March*		Elimination reactions *(of haloalkanes & alcohols; cracking of alkanes)*	p.95 – 97	**p. 103:** Q2 – Q4 **p. 127 – 129:** Q9 – Q15, Q17**,** Q20		
WEEK 9 *10 – 14 March*		Substitution reactions *(of alkanes, haloalkanes, alcohols)*	p. 97 – 98	**p. 103:** Q2 – Q4 **p. 127 – 129:** Q8.6, Q9 – Q15, Q20		
WEEKS 10 & 11 *17 – 28 March*	Time for consolidation and revision *(9 school days)*			**Formal Assessments: Term Test (min 100 marks) & Experiment (min 50 marks)**		



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WEEK 1 *8 – 11 Apr*	**MECHANICS** *18 school days* PAPER 1: 63 marks Watch on YouTube *Videos will be released in April 2025*	**Work, Energy and Power:** Work: Work done by individual forces and net work (*in horizontal, vertical and inclined planes)*	p. 44 – 50	**p. 49 – 50:** Q1 – Q3	- Summary on Work, Energy & Power here - Q&A on Work, Energy & Power here - Watch **The Answer Series Videos** on Work, Energy & Power in Afrikaans & English	
WEEK 2 *14 – 17 Apr*		Energy: Mechanical energy, E_k and work done	p. 50 – 51			
		Work-Energy Theorem ($W_{net} = \Delta E_k$)	p. 51 – 55	**p. 54:** Q1, Q2 **p. 68 – 69:** Q34 – Q36, Q38 & Q39		
		Gravitational Ep and work done; Conservative and non-conservative forces	p. 55 – 56	**p. 58:** Q1, Q2.2		
		Principle of conservation of mechanical energy	p. 56 – 58	**p. 58:** Q2.1 **p. 67:** Q31 & Q33.1	Ballistic pendulum - simulations on the conservation of mechanical energy here and here	
WEEK 3 *22 – 25 Apr*		Work done by non-conservative (external) forces ($w_{nc} = \Delta E_p + \Delta E_k$)	p. 58	**p. 54:** Q1 & Q2 **p. 67 – 69:** Q32, Q33.2, Q37, Q40.1 & Q40.3	Simulation to illustrate the conservation of mechanical energy here	
		Power *(define and calculate)* Power in terms of force and velocity ($P_{ave} = Fv_{ave}$)	p. 59	**p. 61:** Q1, Q2 **p. 69:** Q40, Q41		
		Power of borehole pumps; Min & max power	p. 59 – 60	**p. 61:** Q3		
WEEK 4 *29 Apr – 1 May* ***(Holidays)***	**WAVES, SOUND & LIGHT** *18 school days* PAPER 1: 17 marks	**The Doppler Effect with sound and ultrasound:** The Doppler Effect *(define)*; Stationary sound source, stationary listener; Moving sound source, stationary listener; Stationary sound source, moving listener *(change in the observed frequency/pitch of the sound ($f_L = \frac{v \pm v_L}{v \pm v_s}$) relative to when both the sound source and listener are stationary;)*	p. 135 – 137	**p. 137 – 138:** Q1 – Q3 **p. 141 – 142:** Q1 – Q8	- Simulation on the Doppler Effect here - Watch **The Answer Series Videos** on the Doppler Effect in Afrikaans & English Watch on YouTube	
WEEK 5 *5 – 9 May*		Applications of the Doppler Effect *(ultrasound; medical and other uses)*	p. 138	**p. 142:** Q8.7		
		Doppler Effect and light *(blue and red shifts; expanding of universe)*	p. 139 – 140	**p. 142:** Q9, Q10		
		Rate and degree of reaction: What is meant by rate of reaction? Collision theory *(requirements for a reaction to take place)* Factors affecting the rate of a chemical reaction *(list 5 factors)*	p. 145 – 146	**p. 155:** Q2 – Q4		
WEEK 6 *12 – 16 May*	**CHEMICAL CHANGE** *25 school days* PAPER 2: 84 marks	Nature of reactants; Temperature; Concentration; Reaction surface area of a solid; Catalyst *(explain each factor at the hand of the collision theory)*	p. 146 – 149	**p. 155:** Q5		
		Measuring of reaction rate: Reaction rate graphs *(experimental techniques; interpretation of reaction rate tables and graphs)*	p. 149 – 153	**p. 155:** Q6	- Formal Practical p. 150 – 152: Determine factors affecting rate of a reaction - Practical test and memo – factors affecting rate of a reaction	
		Mechanism of a chemical reaction and of catalysis: Activation energy; The Maxwell-Boltzmann distribution curve *(increase in temperature & concentration)*; Function of a catalyst	p. 153 – 155	**p. 155:** Q7		
WEEK 7 *19 – 23 May*		**Chemical equilibrium:** Factors affecting chemical equilibrium: Open and closed systems; Reversible reaction; Dynamic equilibrium; Factors affecting equilibrium	p. 156 – 160	**p. 170 – 171:** Q2 & Q3	Watch videos on dynamic equilibrium here and here	
		Le Chatelier's Principle *(changes in equilibria and interpretation of graphs concerning concentration & reaction rate)*	p. 162 – 168	**p. 171 – 172:** Q3 & Q4.2	- Practical (informal Assessment) p. 161: Factors that influence equilibrium of $CoCl_2$ in H_2O, NO_2 & N_2O_4 - Watch this video as a visual illustration of the theory	
		The equilibrium constant K_c: Factors affecting K_c	p. 157 – 158 p. 161 – 162	**p. 170 – 171:** Q1, Q3 & Q4.1		

NOTE

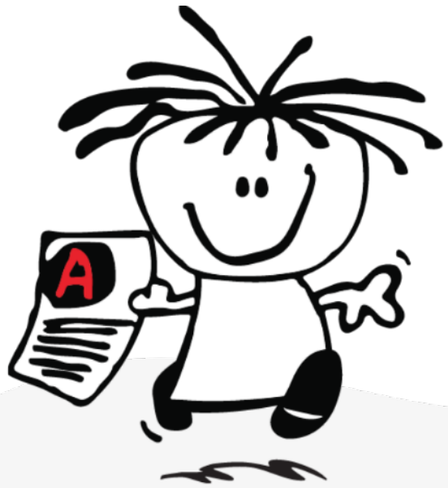
Not all shared resources are TAS creations – some are shared contributions from our Teacher WhatsApp group.

WEEK 8 *26 – 30 May*	**CHEMICAL CHANGE** **(cont.)** *25 school days* PAPER 2: 84 marks	Application: *(Write expression for K_c from an equation; calculation on K_c values; high and low K_c values)*	p. 158 – 160	**p. 170 – 171:** Q1 & Q4.1		
		Acids and bases: Acid-base reactions: Definition *(Arrhenius; Lowry-Bronsted)*; Reaction equations of aqueous solutions	p.172 – 174	**p. 176:** Q1 & Q2 **p. 214:** Q26.1		
		Strength of acids and bases	p.174	**p. 184:** Q1.3 & Q2 **p. 213:** Q23.1, Q23.2 & Q24.1	Simulation on the strength of acids and bases here	
		Concentration of acids and bases	p.174 – 175	**p. 184:** Q1.3& Q2		
		Conjugate acid-base pairs	p.175 – 176	**p.176:** Q3 **p. 184:** Q2.5 & Q2.6 **p. 214:** Q25.2.2		
WEEK 9 *2 – 6 June*		Reactions of acids and bases (neutralisation); Salt hydrolysis; Indicators	p.176 – 179	**p. 178:** Q1 – Q3 **p. 184:** Q1.6 **p. 213 – 214:** Q24.2 & Q25.2.1		
		Acid-base titrations *(calculations)*	p. 179 – 181	**p. 181:** Q1 & Q2 **p. 214:** Q25.2.3, Q26.3 – Q26.5 & Q27	- Formal Practical: Acid-base titration - Practical test and memo – acid-base titration	
		The auto-ionisation of water *(K_w value)*	p. 181 – 182	**p. 184:** Q3		
		Ionisation constants of acids and bases (K_a and K_b values)	p. 182	**p. 184:** Q1.2		
		pH scale *(calculations; strong & weak acids & bases)*	p. 183 – 184	**p. 184:** Q1.4, Q1.5 & Q1.7 **p. 213 – 214:** Q23.3, Q24.3 & Q25.1		
WEEKS 10 – 12 *9 – 27 June*	Time for consolidation and revision *(9 school days)*			**Formal Assessments: June exams (Paper 1: 150 marks & Paper 2: 150 marks)**		

NOTE

Schools will be closed during the week of 28 April to 2 May 2025, due to public holidays on the Monday and Thursday. The content scheduled for week 4, must therefore be divided between week 3 and week 5.

The official ATP for Gr 12 by the Department of Education does not make provision for enough time for the June exams. Some of the content of week 9 and 10 was therefore moved to week 8 and 9, to also make week 10 available for the exam term.



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