Grade 12 Term 1 Topics

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These are the major term 1 topics as listed in the Grade 12 Physical Sciences ATP Document for 2023/2024.

Remember: your school may do topics in a different order or in different terms.

Page	Topic	Physics or Chemistry
3-4	Momentum and Impulse	Physics
5-6	Vertical Projectile Motion	Physics
7-8	Organic chemistry	Chemistry

Page 9-10: Prelim/Trial and final exam info

Summary of topics compiled by Miss Martins

Qualified Physical Sciences and Maths teacher.

Information obtained from the 2023/2024 annual teaching plans accessed at: https://www.education.gov.za/Curriculum/NationalCurriculumStatementsGradesR-12/2023ATPsFET.aspx

STUDY GUIDES FOR PHYSICAL SCIENCES?!
Visit my websitte
www.missmartins.co.za

https://www.missmartins.co.za/copy-of-resources

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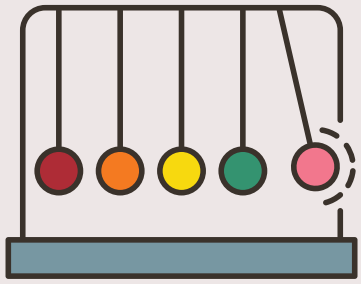
CAPS IEB ALIGNED

MOMENUM & IMPULSE

Sub topics to study and practice



SUB-TOPIC	FORMULAE/THINGS TO KNOW	☑
Define and calculate momentum	$p = mv$	
Change in momentum and vector diagrams	$\Delta p = mv_f - mv_i$	
Newton's second law in terms of momentum and calculating Fnet ; Δt etc	$F_{net} = \frac{\Delta p}{\Delta t}$	
Define and calculate impulse and the impulse-momentum theorem	impulse $= F_{net}\Delta t$ $F_{net}\Delta t = \Delta p$	
Understand isolated systems and impulse and safety considerations		
State and apply the principle of conservation of linear momentum	$m_1v_i + m_2v_i = m_1v_f + m_2v_f$	
Distinguish between elastic and inelastic collisions by calculation	$\frac{1}{2}m_1v_i^2 + \frac{1}{2}m_2v_i^2$ vs. $\frac{1}{2}m_1v_f^2 + \frac{1}{2}m_2v_f^2$ initial kinetic energy of system — Final kinetic energy of system	

REMEMBER TO STUDY EQUATIONS OF MOTION AS WELL AS NEWTON'S LAWS & APPLICABLE FORMULAE FROM GRADE 10 AND 11.

WATCH VIDEOS ON MY CHANNEL TO HELP YOU REVISE & PRACTICE

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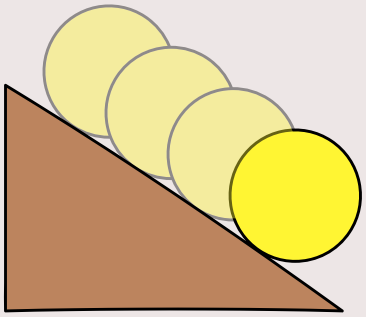
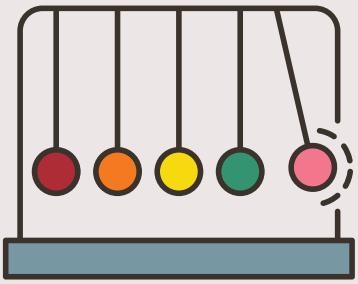


MOMENTUM & IMPULSE

DATA SHEET



$$p = mv$$

$$\Delta p = mv_f - mv_i$$

$$F_{net}\Delta t = \Delta p$$

These are on your data sheet!

Use if linear momentum is conserved

$$\Sigma p_i = \Sigma p_f$$

$$m_1v_{i_1} + m_2v_{i_2} = m_1v_{f_1} + m_2v_{f_2}$$

and

$$\Sigma E_{ki} = \Sigma E_{kf}$$

$$\frac{1}{2}m_1v_{i_1}^2 + \frac{1}{2}m_2v_i^2 = \frac{1}{2}m_1v_{f_1}^2 + \frac{1}{2}m_2v_{f_2}^2$$

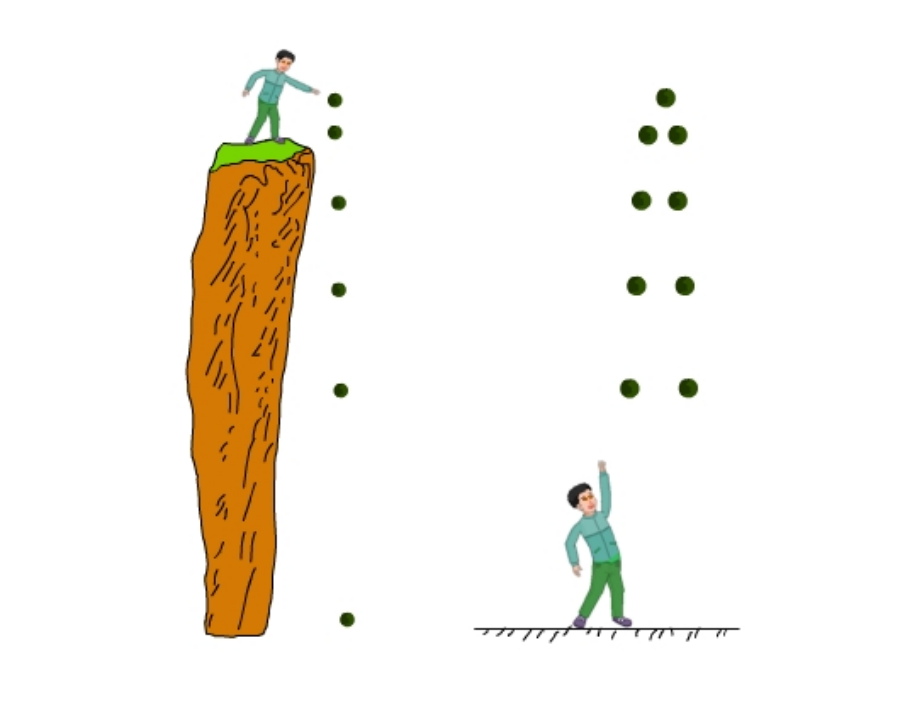
These are NOT on your data sheet!

use if collision is elastic
you MUST be told that the collision is elastic for you to use an equal sign!

VERTICAL PROJECTILE MOTION

Sub topics to study and practice

SUB-TOPIC	FORMULAE/THINGS TO KNOW	☑
Explain what is meant by a projectile and projectile motion		
Use equations of motion to determine position, velocity, displacement		
Sketch x vs. t ; v vs. t and a vs. t graphs for free falling objects; objects thrown up or down or a bouncing object		
Determine/calculate position, displacement, velocity or acceleration from x vs. t and v vs. t graphs		
Describe motion of an object of an object bouncing, thrown up, down etc when given graphs		



VERTICAL PROJECTILE MOTION

DATA SHEET

* $V_f = V_i + a\Delta t$

* $V_f^2 = V_i^2 + 2a\Delta y$

* $\Delta y = V_i \Delta t + \frac{1}{2} a \Delta t^2$

* $\Delta y = \left(\frac{V_i + V_f}{2} \right) \Delta t$

V_f = final velocity ($m.s^{-1}$)

V_i = initial velocity ($m.s^{-1}$)

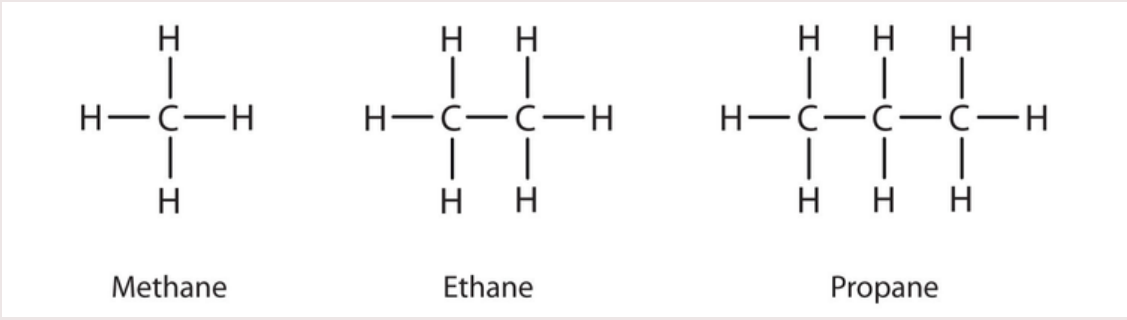
a = gravitational acceleration ($9,8\ m.s^{-2}$ down)

Δt = time (s)

ORGANIC CHEMISTRY

Sub topics to study and practice

SUB-TOPIC	FORMULAE/THINGS TO KNOW	☑
Define organic molecules, functional group, hydrocarbon homologous series; saturated vs. unsaturated		
Write structural, molecular and condensed structural formulae for the following homologous series:	- alkanes - alkenes - alkynes - haloalkanes - alcohols - ketones - aldehydes - carboxylic acids - esters	
Write IUPAC names for structural, molecular and condensed structural formulae		
Isomers → identify, name and draw structural isomers (chain, positional, functional)		
Understand the following physical properties: boiling point, melting point, vapour pressure		
Understand and explain the relationship between physical properties and strength of IMF, type of functional group, chain length and branching.		



ORGANIC CHEMISTRY

Sub topics to study and practice

SUB-TOPIC	FORMULAE/THINGS TO KNOW	☑
Equation and reaction conditions for the formation of an ester and IUPAC names for reactants and product		
Combustion of alkanes in excess oxygen		
Identify and classify reactions as addition, substitution or elimination		
Write equations and reaction conditions for addition reactions		
Write equations and reaction conditions for elimination reactions		
Write equations and reaction conditions for substitution reactions		

Prelim/trial and final exam info!

Paper 1: Physics

Time: 3 hours

Total marks: 150

TOPIC	SUB-TOPIC	MARK ALLOCATION
MECHANICS	• NEWTONS LAWS (GRADE 11) • VERTICAL PROJECTILE MOTION • MOMENTUM & IMPULSE • WORK ENERGY POWER	65
WAVES, SOUND & LIGHT	• THE DOPPLER EFFECT	15
ELECTRICITY & MAGNETISM	• ELECTROSTATICS (GR 11) • ELECTRIC CIRCUITS (INCLUDING GR 11 STUFF) • ELECTRODYNAMICS	55
MATTER & MATERIALS	• OPTICAL PHENOMENA AND PROPERTIES OF MATERIALS (PHOTOELECTRIC EFFECT)	15

PRELIM/TRIAL AND FINAL EXAM INFO!

Paper 2: Chemistry

Time: 3 hours

Total marks: 150

TOPIC	SUB-TOPIC	MARK ALLOCATION
MATTER AND MATERIALS	• ORGANIC MOLECULES (ORGANIC CHEMISTRY) • INTERMOLECULAR FORCES	58
CHEMICAL CHANGE	• RATE AND EXTENT OF REACTION • CHEMICAL EQUILIBRIUM • ACIDS AND BASES • REPRESENTING CHEMICAL CHANGE (GRADE 10) • ENERGY AND CHEMICAL CHANGE (GRADE 11) • STOICHIOMETRY APPLICATION (GRADE 11) • ELECTROCHEMICAL REACTIONS (ELECTROCHEMISTRY)	92