

Study Content
for
Physics
From
Grade 9-12

When you study Physics Grade 11 You should study grade 9 or grade 10 by creating link

<i>Physics</i>	<i>Topic</i>	<i>Link with Physics</i>	<i>Topic</i>
Grade 11 <u>Unit 1</u>	Measurement and practical work ✓	-	-
Grade 11 <u>Unit 2</u>	<u>Vector quantities</u>	Grade 9 <u>Unit 1</u>	Vectors ✓ ✓ scale diagram ~
Grade 11 <u>Unit 3</u>	<u>Kinematics</u>	Grade 9 <u>Unit 2</u>	<u>Motion in a straight line</u>
		Grade 10 <u>Unit 1</u>	<u>Motion in 2D</u> ✓ ✓ horizontal projection ✓ ✓ Rotational kinematics ✓ ✓ Rotational Dynamics ✓ ✓ condition of equilibrium ✓ ✓ Keppler's laws of planetary motion ~ ✓ Escape velocity of a satellite ✓ ✓ orbital velocity of a satellite ✓
Grade 11 <u>Unit 4</u>	<u>Dynamics</u>	Grade 9 <u>Unit 3</u>	<u>Forces and Newton's laws of motion</u> ✓ contact force and non-contact force ~ ✓ Newton's <u>Law</u> of motion ✓ True <u>weightlessness</u> and <u>apparent weightlessness</u> ✓ <u>apparent weight</u> and <u>True weight</u> of elevator
Grade 11 <u>Unit 5</u>	Work, energy and power	Grade 9 <u>Unit 4</u>	<u>Work, energy and power</u> ✓ Work against gravity, friction, and gravity and friction! ✓ $W = -\Delta U$ ✓ Power and velocity
Grade 11 <u>Unit 6</u>	Rotational motion ✓	-	-
Grade 11 <u>Unit 7</u>	Equilibrium ✓	-	-
Grade 11 <u>Unit 8</u>	Properties of bulk matter ✓	Grade 9 <u>Unit 6</u>	<u>Fluid statics</u>

When you study Physics Grade 12 You should study grade 9 or grade 10 by creating link

<i>Physics</i>	<i>Topic</i>	<i>Link with Physics</i>	<i>Topic</i>
<u>Grade 12 Unit 1</u>	<u>Thermodynamics</u>	<u>Grade 9 Unit 7</u>	Temperature and heat ✓ What happens when a substance absorbs heat energy? ✓ Thermal equilibrium ✓ Second law of thermodynamics ✓ 7.2 Expansion of solids, liquids and gases ✓ 7.3 Quantity of heat, specific heat capacity and heat capacity ✓ 7.4 Changes of state
<u>Grade 12 Unit 2</u>	Oscillations and waves	<u>Grade 9 Unit 8</u>	Wave motion and sound ✓ Mechanical vs. electromagnetic waves ✓ Examples of mechanical waves ✓ The speed of sound(in gas related to temperature)
<u>Grade 12 Unit 3</u>	<u>Wave optics</u>	<u>Grade 10 Unit 6</u>	Electromagnetic waves and geometrical optics
<u>Grade 12 Unit 4</u>	<u>Electrostatics</u>	<u>Grade 10 Unit 2</u>	Electrostatics ✓ ✓ 2.1 Electric charge
<u>Grade 12 Unit 5</u>	<u>Steady electric current and circuit properties</u>	<u>Grade 10 Unit 3</u>	Current electricity ✓ Electric energy from chemicals ✓ Sources of electricity ✓ Primary cells and secondary cells ✓ Electric energy from heat ✓ The thermocouple thermometer ✓ Definitions for electrical energy and power ✓ Cost of electrical energy
<u>Grade 12 Unit 6</u>	<u>Magnetism</u>	<u>Grade 10 Unit 4</u>	Electromagnetism ✓ What are magnetic domains? ✓ Magnetization ✓ Explaining the results in terms of magnetic domains ✓ Magnetic shielding ✓ Fleming's left-hand rule
<u>Grade 12 Unit 7</u>	<u>Electromagnetic induction and a.c. circuits</u> ✓	<u>Grade 10 Unit 4</u>	Electromagnetism Grade 12 th content is enough
<u>Grade 12 Unit 8</u>	Atomic physics ✓	-	-

Units that you should read it separately/ individually

<i>Physics Grade 9</i>	<i>Topic</i>	<i>Physics Grade 9</i>	<i>Topic</i>
<u>Unit 5</u>	<u>Simple machines</u>	Unit 5	<u>Introduction to electronics</u> ✓

Mathematics from Grade 9-12

When you study Mathematics Grade 11 You should study grade 9 or grade 10 by creating link

<i>Maths</i>	<i>Topic</i>	<i>Link with Maths</i>	<i>Topic</i>
Grade 11 Unit 1	Further on Relation and function	Grade 9 Unit 4	Relation and Function ✓ Graph of quadratic Functions ✓ Maximum and minimum value of Quadratic function
Grade 11 Unit 2	Rational expression and Rational Function	---	---
Grade 11 Unit 3	Coordinate Geometry	Grade 10 Unit 4	Coordinate geometry ✓ Division of a line segment
Grade 11 Unit 4	Mathematical Reasoning	-	-
Grade 11 Unit 5	Statistics and Probability	Grade 9 Unit 6	Statistics and probability
Grade 11 Unit 6	Matrices and Determinant	-	-
Grade 11 Unit 7	Set of complex Number	-	-
Grade 11 Unit 8	Vector and transformation of plane	Grade 9 Unit 7	Vector into dimension
Grade 11 Unit 9	Further on Trigonometric functions	Grade 10 Unit 5	Trigonometric functions ✓ Reference angle(θ_R) ✓ Angles larger than 360° ✓ Co-functions ✓ Co-terminal angles

Units that you should read it separately/ individually

<i>Maths Grade 9</i>	<i>Topic</i>	<i>Maths Grade 10</i>	<i>Topic</i>
Unit 1	The number system	Unit 1	Polynomial Function
Unit 2	Solution of Equations	Unit 2	Exponential and logarithmic Function
Unit 3	Further on set	Unit 3	Solving Inequality
Unit 5	Geometry and Measurement	Unit 6	Plane Geometry
		Unit 7	Measurement

Grade 12

<i>Maths Grade 12</i>	<i>Topic</i>
Unit 1	Sequences and Series
Unit 2	Introduction to Limits and Continuity
Unit 3	Introduction to Differential Calculus
Unit 4	Applications of Differential Calculus
Unit 5	Introduction to Integral Calculus
Unit 6	Three Dimensional Geometry and Vectors in Space
Unit 7	Mathematical Proofs

Chemistry

From

Grade 9-12

When you study **Chemistry** Grade 11 You should study grade 9 or grade 10 by creating link

<i>Chemistry</i>	<i>Topic</i>	<i>Link with chemistry</i>	<i>Topic</i>
Grade 11 Unit 1	Fundamental Concepts in Chemistry	-	-
Grade 11 Unit 2	Atomic Structure and Periodic Table	Grade 9 Unit 1 and unit 2	Structure of the Atom Periodic Classification of the Elements ✓ The Atomic Models
Grade 11 Unit 3	Chemical Bonding and Structure	Grade 9 Unit 3	Chemical Bonding and Intermolecular Forces
Grade 11 Unit 4	Chemical Kinetics	-	-
Grade 11 Unit 5	Chemical Equilibrium and Phase Equilibrium	-	-
Grade 10 Unit 1	Introduction to organic Chemistry	Grade 11 Unit 6	Carboxylic Acids, Ester, Fat and oil ✓ Carboxylic Acids ✓ Fats and Oils

When you study chemistry Grade 12 You should study grade 9 or grade 10 by creating link

<i>Physics</i>	<i>Topic</i>	<i>Link with Physics</i>	<i>Topic</i>
Grade 12 Unit 1	Solutions	-	-
Grade 12 Unit 2	Acid-Base Equilibrium	Grade 10 Unit 2	Important inorganic Compounds ✓ Oxides ✓ Acids ✓ Bases ✓ Salts
Grade 12 Unit 3	Introduction to Chemical Thermodynamics	-	-
Grade 12 Unit 4	Electrochemistry	Grade 10 Unit 3	Electrochemistry
Grade 12 Unit 5	Some Elements in Nature and Industry	Grade 10 Unit 4	Chemistry in industry and Environmental pollution ✓ Production of some ✓ Important Metals and Non-Metals ✓ Some Industries in Ethiopia ✓ Environmental Pollution
Grade 12 Unit 6	Polymers	-	-

Units that you should read it separately/ individually

<i>Chemistry</i>	<i>Topic</i>
Grade 9 Unit 4	Chemical Reaction and Stoichiometry
Grade 9 Unit 5	Physical state of matter