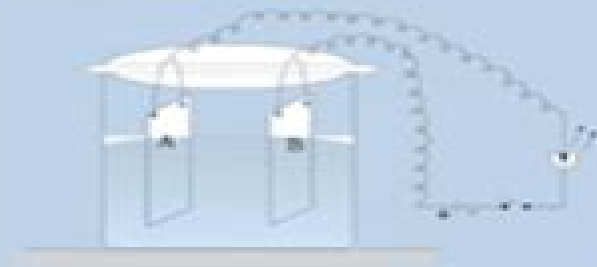


# LABORATORY MANUAL

Class XII

# PHYSICS



# Class 12 Ncert Physics Practical Lab Manual

**KUNDAN KUMAR**



## **Class 12 Ncert Physics Practical Lab Manual:**

*Practical/Laboratory Manual Physics Class XI based on NCERT guidelines by Dr. J. P. Goel & Er. Meera Goyal* Dr. J. P. Goel ,Er. Meera Goyal,2020-06-24

**SECTION A EXPERIMENTS**

1 Measurement of Length 1 To measure the diameter of a small spherical cylindrical body by using a vernier callipers 2 To measure the dimensions of a given regular body of known mass using vernier callipers and hence find its density 3 To measure the internal diameter and depth of a given cylindrical vessel say calorimeter beaker by using vernier callipers and hence find its internal volume i.e. capacity Viva voce 2 Screw Gauge Micrometer 4 To determine the diameter of a given wire using a screw gauge and find its volume 5 To find the thickness of a given sheet with the help of screw gauge 6 To measure the volume of an irregular lamina by using a screw gauge Viva voce 3 Spherometer 7 To measure the radius of curvature of a given spherical surface convex lens by using a spherometer Viva voce 4 Mass and Weight 8 To determine the mass of two different objects using a beam balance Viva voce 5 Parallelogram Law of Vectors 9 To find the weight of a given body using parallelogram law of vectors Viva voce 6 Simple Pendulum Measurement of Time 10 Using a simple pendulum plot  $L$  vs  $T$  and  $L$  vs  $T^2$  graphs Hence find the effective length of a second's pendulum using appropriate graphs Viva voce 7 Friction 11 To study the relationship between force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface Viva voce 8 Motion of a Body Along an Inclined Plane 12 To find the downward force along an inclined plane acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination by plotting graph between force and  $\sin \theta$  Viva voce

**SECTION B EXPERIMENTS**

1 Elasticity 1 To determine the Young's modulus of elasticity of the material of the wire using Searle's apparatus Viva voce 2 Spring Constant 2 To find the spring constant of a helical spring by plotting load extension graph Viva voce 3 Boyle's Gas Law 3 To study the variation in volume with pressure for a sample of air constant temperature by plotting graphs between  $P$  and  $V$  and between  $P$  and  $1/V$  18 Viva voce 4 Surface Tension 4 To determine the surface tension of water by capillary rise method Viva voce 5 Viscosity 5 To determine the coefficient of viscosity of given liquid by measuring the terminal velocity of a given spherical body in it Viva voce 6 Newton's Law of Cooling 6 To study the relationship between temperature of a hot body and time by plotting a cooling curve Viva voce 7 Vibrations of Strings 7 To study the relation between frequency and length for a given wire under constant tension using a sonometer Viva voce 8 To study the relation between the length of a given wire and tension for constant frequency using sonometer Viva voce 8 Vibrations of Air Columns 9 To find the velocity of sound in air at room temperature using a resonance tube by two resonance position Viva voce 9 Specific Heat 10 To determine specific heat of a given solid by the method of mixture 11 To determine the specific heat of a given liquid by method of mixture Viva voce

**SECTION A ACTIVITIES**

1 To make a paper scale of given least count e.g. 0.2 cm, 0.5 cm and use it to measure the length of a given object 2 To determine the mass of a given body using a metre scale and by applying principle of moments Viva voce 3 To plot a graph for a given set of data using proper

choice of scales and error bars Viva voce 4 To measure the force of limiting friction for rolling of a roller on horizontal plane Viva voce 5 To study the variation in the range of a jet of water with angle of projection Viva voce 6 To study the conservation of energy of a ball rolling down on inclined plane using a double inclined plane Viva voce 7 To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time Viva voce SECTION B ACTIVITIES 1 To observe the change of the state and plot a cooling curve for molten wax Viva voce 2 To observe and explain the effect of heating on a bimetallic strip Viva voce 3 To note the change in level of liquid in a container on heating and interpret the observations Viva voce 4 To study the effect of detergent in surface tension by observing capillary rise Viva voce 5 To study the factors affecting the rate of loss of heat of a liquid Viva voce 6 To study the effect of load on depression of a suitably clamped meter scale loaded i at its end ii in the middle Viva voce 7 To observe the decrease in pressure with the increase in velocity of the fluid Viva voce APPENDIX Some Important Tables of Physical Constants Log Antilog and other Tables **Lab Sparks:**

**Amazing Physics - Level-2 for Classes 9-12: A Student-Friendly Practical Manual | You Can See, Feel & Explore! |**

**30+ Visual Experiments Based on NCERT/CBSE & NEP 2020** KUNDAN KUMAR, 2025-10-13 Ignite the Spark of Advanced Physics with Over 35 Electrifying Experiments That Will Blow Your Mind Welcome to Lab Sparks Amazing Physics Level 2 a student friendly practical manual designed for curious minds in Classes 9 12 Ages 14 18 This book transforms complex physics concepts into hands on real world experiments perfect for board practicals NEET JEE preparation and science enthusiasts From building your own electric motor to making sound waves visible from magnetic levitation to harnessing solar energy every experiment is crafted to make advanced physics engaging safe and unforgettable What's Inside Step by step instructions with emoji based visuals Real life connections see how motors generators and optics work in daily life Advanced Analysis Graphical methods mirror formula Snell's Law and more Safety tips teacher notes for every activity Aligned with NCERT CBSE syllabus and NEP 2020 guidelines Perfect for project files science exhibitions and competitive exam prep Imagine Building a homopolar motor that spins using just a battery magnet and wire Making light bend like magic with a prism and discover rainbows inside Feeling sound vibrate through air in a resonance tube Defying gravity with magnetic levitation Lighting a bulb using just a pencil lead and a 9V battery This book is more than a lab manual it's a launchpad for future engineers scientists and innovators It builds critical thinking problem solving skills and a deep love for the invisible forces that shape our world Perfect For CBSE State Board Students Class 9 12 NEET JEE Mains Aspirants Science Teachers Coaching Centers School Practical Files Science Fair Projects Gift for Young Scientists Who Love to Explore By Kundan Kumar PGT Chemistry Creator of Short Sweet Chemistry YouTube and Founder of Short Sweet Services Because Physics Isn't Just Formulas It's Energy in Motion Ready to turn ordinary ingredients into extraordinary adventures Let's get started **Lab Sparks: Amazing Physics - Complete Edition for Classes 6-12: The Ultimate Practical**

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Science Exhibition Projects Gift for Young Scientists Who Love to Explore By Kundan Kumar PGT Chemistry Creator of Short Sweet Chemistry YouTube and Founder of Short Sweet Services Because Physics Isn't Just Formulas It's Energy in Motion Ready to turn ordinary ingredients into extraordinary adventures Let's get started *Lab Sparks: Amazing Chemistry - Complete Edition for Classes 6-12: The Ultimate Practical Manual | You Can See, Feel & Explore! | 70+ Experiments from Kitchen Science to Barking Dog Reaction | Aligned with NCERT, CBSE & NEP 2020* KUNDAN KUMAR, 2025-07-14 The Ultimate Science Adventure Awaits Discover the Magic of Chemistry with Over 70 Hands On Experiments That Will Blow Your Mind Welcome to Lab Sparks Amazing Chemistry Complete Edition the most comprehensive and student friendly practical manual ever created for young scientists in Classes 6-12 Ages 10-18 Whether you're making balloons inflate without blowing or witnessing the Barking Dog Reaction roar this book turns abstract chemistry concepts into real touchable experiences From kitchen science to dramatic explosions every experiment is designed to spark curiosity ignite wonder and make learning unforgettable What's Inside 70 Visual Experiments From fizzing reactions to glowing liquids Step by Step Instructions with emoji based visuals diagrams Real Life Connections See how chemistry works in daily life Safety Tips Student Reflections after every activity Aligned with NCERT CBSE Syllabus NEP 2020 Guidelines Perfect for Practical Files Science Fairs Project Work Competitive Exam Prep NEET JEE Graded Difficulty Simple Home Experiments Class 6-8 to Advanced Lab Activities Class 9-12 Imagine Balloons that inflate using just vinegar and baking soda Liquids that change color like magic with kitchen indicators Making rainbows with a mirror and water Growing crystals at home Fire tornadoes in a jar safely observed The legendary Barking Dog Reaction that roars with blue flame This isn't just a lab manual it's a journey from Why to Wow It builds scientific thinking problem solving skills and a lifelong love for the invisible forces that shape our world Perfect For CBSE State Board Students Class 6-12 NEET JEE Mains Aspirants Science Teachers Homeschooling Parents School Practical Files Science Exhibition Projects Gift for Young Scientists Who Love to Explore By Kundan Kumar PGT Chemistry Creator of Short Sweet Chemistry YouTube and Founder of Short Sweet Services Because Chemistry Isn't Just Formulas It's Magic in a Bottle Ready to turn ordinary ingredients into extraordinary adventures Let's get started

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every activity Aligned with NCERT CBSE syllabus and NEP 2020 guidelines Perfect for project files science fairs and classroom learning Imagine Balloons that inflate using just vinegar and baking soda Liquids that change color like magic with kitchen indicators Making rainbows with a mirror and water Growing crystals at home Fire tornadoes in a jar safely observed This book is more than a lab manual it s a spark that ignites curiosity builds scientific thinking and turns every young learner into a real life chemist Perfect For CBSE State Board Students Class 6 8 Science Teachers Homeschooling Parents School Practical Files Science Exhibition Projects Gift for Young Scientists Who Love to Explore By Kundan Kumar PGT Chemistry Creator of Short Sweet Chemistry YouTube and Founder of Short Sweet Services Because Chemistry Isn t Just Formulas It s Magic in a Bottle Ready to turn ordinary ingredients into extraordinary adventures Let s get started *Lab Sparks: Amazing Chemistry - Level-2 for Classes 9-12: A Student-Friendly Practical Manual | You Can See, Feel & Explore! | 35+ Advanced Experiments* KUNDAN KUMAR,2025-07-14 Ignite the Spark of Advanced Chemistry with Over 35 Electrifying Experiments That Will Blow Your Mind Welcome to Lab Sparks Amazing Chemistry Level 2 a student friendly practical manual designed for curious minds in Classes 9 12 Ages 14 18 This book transforms complex chemistry concepts into hands on real world experiments perfect for board practicals NEET JEE preparation and science enthusiasts From the dramatic Barking Dog Reaction to glowing liquids from color changing indicators to electrolysis of water every experiment is crafted to make advanced chemistry engaging safe and unforgettable What s Inside Step by step instructions with emoji based visuals Real life connections see how chemical reactions power rockets batteries and life itself Advanced Analysis Titration gas laws reaction kinetics and more Safety tips teacher notes for every activity Aligned with NCERT CBSE syllabus and NEP 2020 guidelines Perfect for project files science exhibitions and competitive exam prep Imagine Watching the Barking Dog Reaction roar with blue flames and sound Making light glow from chemicals chemiluminescence Splitting water into hydrogen and oxygen using electricity Seeing colors change like magic with acid base indicators Creating crystals that grow before your eyes This book is more than a lab manual it s a launchpad for future scientists doctors and engineers It builds critical thinking problem solving skills and a deep love for the invisible reactions that shape our world Perfect For CBSE State Board Students Class 9 12 NEET JEE Mains Aspirants Science Teachers Coaching Centers School Practical Files Science Fair Projects Gift for Young Scientists Who Love to Explore By Kundan Kumar PGT Chemistry Creator of Short Sweet Chemistry YouTube and Founder of Short Sweet Services Because Chemistry Isn t Just Formulas It s Magic in a Bottle Ready to turn ordinary ingredients into extraordinary adventures Let s get started Practical/Laboratory Manual Physics Class XII based on NCERT guidelines by Dr. Sunita Bhagia & Megha Bansal Dr. J. P. Goel, Er. Meera Goyal,2020-06-24 SECTION A EXPERIMENTS 1 To determine resistance per cm of a given wire by plotting a graph for potential difference versus current 2 To find resistance of a given wire using meter bridge and hence determine the specifi resistance Resistivity of its material 3 To verify the laws of combination Series Parallel of resistance using ameter bridge 4 To compare the e m f of two given

primary cells using potentiometer 5 To determine the internal resistance of a given primary cell e g Leclanche cell using potentiometer 6 To determine the resistance of a galvanometer by half deflection method and to find its figure of merit 7 A To convert a given galvanometer of known resistance and figure of merit into an ammeter of desired range and to verify the same 7 B To convert a given galvanometer of known resistance and figure of merit into a voltmeter of desired range and to verify the same 8 To find the frequency of AC mains with a sonometer and horse shoe magnet

### SECTION B EXPERIMENTS

1 To find the value of  $v$  for different values of  $u$  in case of a concave mirror and to find the focal length 2 To find the focal length of a convex lens by plotting graph between  $u$  and  $v$  or  $1/u$  and  $1/v$  3 To find the focal length of a convex mirror using a convex lens 4 To find the focal length of a concave lens using a convex lens 5 To determine the angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and angle of deviation 6 To determine refractive index of a glass slab using a travelling microscope 7 To find the refractive index of a liquid by using a convex lens and a plane mirror 8 To draw I V characteristics curve of a p n junction in forward bias and reverse bias 9 To draw the characteristics curve of a zener diode and to determine its reverse break down voltage 10 To study the characteristics of a common emitter n p n or p n p transistor and to find out the values of current and voltage gains

### SECTION A ACTIVITIES

1 To measure the resistance and impedance of an inductor with or without iron core 2 To measure resistance voltage AC DC current AC and check continuity of given circuit using multimeter 3 To assemble a household circuit comprising of three bulbs three on off switches a fuse and a power source 4 To assemble the components of a given electrical circuit 5 To study the variation in potential drop with length of a wire for a steady current 6 To draw the diagram of a given open circuit comprising atleast a battery resistor rheostat key ammeter and voltmeter Make the components that are not connected in proper order and correct the circuit and also the circuit diagram

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1 To study effect of intensity of light by varying distance of the source on an LDR Light Depending Resistor 2 To identify a diode a LED a transistor an IC a resistor and a capacitor from mixed collection of such items 3 Use a multimeter to i identify the transistor ii distinguish between n p n and p n p type transistor iii see the unidirectional flow of current in case of a diode and a LED iv Check whether a given electronic components e g diode transistor or IC is in working order 4 To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab 5 To observe polarisation of light using two polaroids 6 To observe diffraction of light due to a thin slit 7 To study the nature and size of the image formed by i convex lens ii concave mirror on a screen by using candle and a screen for different distance of the candle from the lens mirror 8 To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses

### SUGGESTED INVESTIGATORY PROJECT

1 To Study Various factors on which the Internal Resistance EMF of a cell depends 2 To study the variations in current following in a circuit containing L D R because of variation a In the power of incandescent lamp used to illuminate the L D R Keeping all the lamps in fixed position b In the Distance of a incandescent lamp of fixed power used to illuminate the L D R 3 To find the

refractive indices of a Water b Oil Transparent using a plane mirror an equiconvex lens made from a glass of known refractive index and an adjustable object needle 4 To design an appropriate logic gate combination for a given truth table 5 To investigate the relation between the ratio of i Output and Input voltage ii Number of turns in secondary coils and primary coils of a self designed transformer 6 To Investigate the dependence of angle of deviation on the angle of incidence using a hollow prism filled one by one with different transparent fluids 7 To Estimate the charge induced on each one of the two identical styrofoam balls suspended in a vertical plane by making use of Coulomb's Law 8 To study the factors on which the self inductance of a coil depends by observing the effect of this coil when put in series with a resistor bulb in a circuit fed up by an a.c. source of adjustable frequency 9 To study the earth's magnetic field using a tangent galvanometer

**APPENDIX** Some Important Tables of Physical Constants Logarithmic and other Tables Annual Report India. Department of Information Technology, 2010

**CBSE Laboratory Manual Physics Class 12th** Er. Akash Shukla, 2022-12-13 Once Owen Chamberlain said The development of Physics like the development of any science is a continuous one It is a constant effort of NCERT that it puts on its textbooks to promote clearer understanding of concepts in every student As important as theoretical study is practical study is also essential to prove theories into realities The freshly updated edition of **LABORATORY MANUAL Physics** for class XII has been designed as a complete package to understand all the relevant Physics experiments in a simple lucid and interactive manner Strictly based on CBSE guidelines each experiment includes theory to give deep insights into each concept formula term definition etc Viva Voce questions Precautions Activities Diagrams and Appendices are accumulated to make concepts clearer in accordance with the curriculum Along with the experiments suggested Investigatory Projects will reveal the complete adherence of CBSE curriculum This book serves as a step by step guide for conducting experiments in such a way that students will not need to refer to any other book for explanations of the concepts An all inclusive guidance book for Physics laboratory experiment Coverage of each experiment in a simple and lucid manner Detailed and Step by Step procedure for each experiment Necessary precautions to be followed for the experiment Viva Voce Questions to get an understanding on the experiment Suggested Investigatory Projects of the CBSE curriculum Clearly labeled Diagrams in each experiment Appendices related to some useful data

**TABLE OF CONTENT** General Introduction of Practical Work How to Record an Experiment Experimental Errors Logarithms Basic Trigonometry Study of Graphs Section A Experiments Activities Section B Experiments Activities Suggested Investigatory Projects Appendices Practical/Laboratory Manual Physics Class - XII -by Er. Meera Goyal (SBPD Publications) Er. Meera Goyal, 2021-07-03 In accordance to the new syllabus of Central Board of Secondary Education CBSE New Delhi and other State Boards following CBSE Curriculum

**Practical/Laboratory Manual Physics Class XII based on NCERT guidelines by Dr. Sunita Bhagia & Megha Bansal** Dr. J. P. Goel ,Er. Meera Goyal ,2020-06-23

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**Practical/Laboratory Manual Physics Class - 12** Er. Meera Goyal, 2023-04-30 Sections A 1 Experiments 2 Activities Sections B 1 Experiments 2 Activities 3 Suggested Investigatory 4 Project Work

**Core Laboratory Manual of Physics for Class XII** Anil Sharma, Prashant Sharma, 2020-04-16 Goyal Brothers Prakashan

*Chemistry Lab Manual Class XII Follows the Latest CBSE Syllabus and Other State Board Following the CBSE Curriculum.* Edugorilla Prep Experts, 2022-07-05

Chemistry is all about conducting various experiments and having a deep study about them This deep analysis and study cannot solely be done with theories and practical experiments are necessary for better skill development of the students Considering this every year CBSE conducts the chemistry practicals in addition to the theory examinations This class 12 chemistry lab manual contains all the essential information that the students will require while commencing the practicals CBSE class 12th chemistry lab manual has been prepared strictly according to CBSE guidelines which follows the NCERT and other State Board curriculum All the experiments in this lab manual have been given in a simple lucid and interactive manner The theory given with each experiment gives complete knowledge of each term concept and definition in order to provide a compact knowledge to the students at one place Viva Voce questions are given with each experiment to test students understanding of related experiments Mr Kaushalesh Dwivedi is the author of this complete lab activity book for class 12 chemistry All the lab based experiments have well labeled diagrams which clearly demonstrate the details of the apparatus that are used the correct way of handling Laboratory apparatus and perform the experiments methodically The basic purpose of this lab manual is to provide the students with appropriate guidance so that they can easily understand carry out and document the experiments in the Science Laboratory The Lab Manual comes with practical lessons followed by Lab experiments after each chapter projects and Notebook for jotting down all the essential information The aim of this Science Lab Manual is to help class 12 students to prepare and understand the complex chemistry concepts through experimental approach by utilizing pedagogically enhanced content of the lab manual and with a compact knowledge base

for improving their analytical experimental skills and learning abilities      Physics Lab Manual Class XII According to the Latest CBSE Syllabus and Other State Boards Following the CBSE Curriculum Edugorilla Prep Experts, 2022-08-18 The all new class 12 physics Lab Manual by Mr Pradeep Dwivedi is strictly based on the curriculum prescribed by CBSE State Boards of Chhattisgarh Haryana Bihar Jharkhand Kerala Mizoram Meghalaya and other state boards All the experiments in this Science Lab Manual have been given in a simple lucid and interactive manner The theory given with each experiment gives complete knowledge of each term concept and definition in order to provide a compact knowledge to the students at one place Viva Voce questions are given with each experiment to test students understanding of related experiments All the lab based experiments have well labeled diagrams which clearly demonstrate the details of the apparatus that are used the correct way of handling laboratory apparatus and perform the experiments methodically The basic purpose of this Lab Manual is to provide the students with appropriate guidance so that they can easily understand carry out and document the experiments in the Science Laboratory Some demonstration experiments are also included to illustrate principles and laws of physics Illustrative diagrams have been used at the places where it is required The Lab Manual comes with practical lessons followed by lab experiments after each chapter projects and attached Notebook for jotting down all the essential information The aim of this Science Lab Manual is to help class 12 students to prepare and understand the complex physics concepts through experimental approach by utilizing pedagogically enhanced content of the Lab Manual and with a compact knowledge base for improving their analytical experimental skills and learning abilities      **Lab**

**Manual-Physics-TB-12\_E-R** Dr R K Gupta, Lab Manual Physics TB 12\_E R      **Lab Manual-Physics-TB-11\_E-R1** Dr R K Gupta, Lab Manual Physics TB 11\_E R1      *Comprehensive Practical Physics XI* J. N. Jaiswal, 2012-08      Physics Laboratory Manual for Undergraduates Dr.Yusuf Hanif Shaikh , Dr.Shailendra Bhalchandra Kolhe , We are happy to bring out this book titled Physics Laboratory Manual for Undergraduates It contains 16 experiments based on concepts from mechanics fluid mechanics electricity magnetism optics and electronics This book has been written to meet the requirements of undergraduate students Text has been thoroughly revised and brought up to date by adding essential experiments In this book theory formulae regarding the experiment have been included List of necessary apparatus for the experiment has been given Experimental procedure in systematic steps has been included in it The observations in tabular form have been encouraged throughout the text Precautions have been given at the end of the experiment so that students can follow them while performing the experiment We hope that all these features of the book will prove very useful for the students Suggestions about any errors mistakes doubts additions and deletions in the book are also invited If the students find any difficulty in these experiments they may please write an email to the authors A critical review from the academic community will indeed help us in future Our sincere thanks to Kailash publication and its entire staff for publishing this book We extend our thanks to our family members for their support during preparation of this manuscript Lastly we extend our sense of

gratitude towards all those who helped us in this endeavor directly and indirectly

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