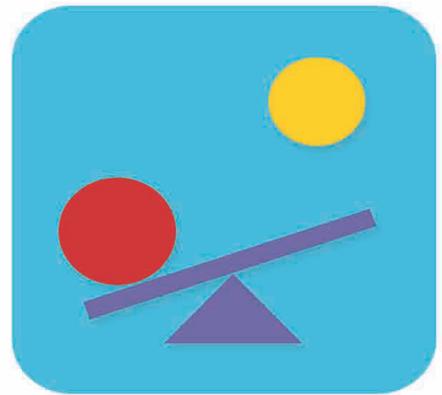
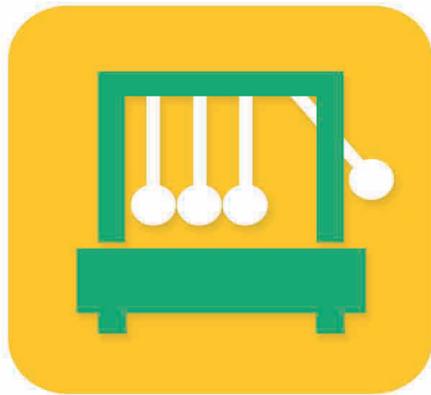
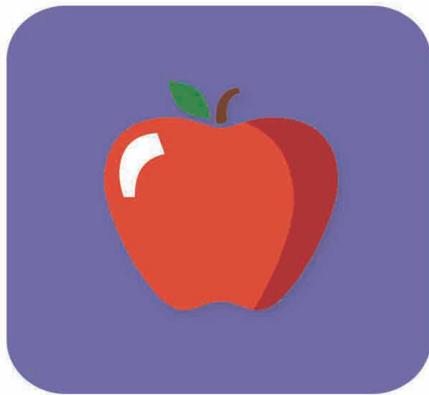
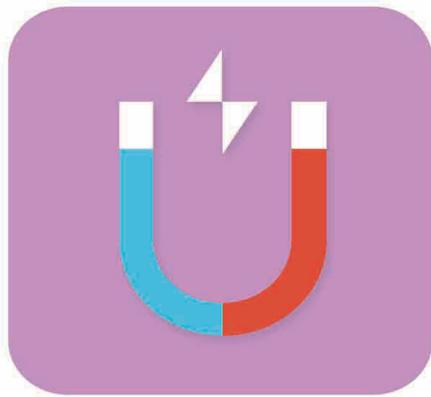


# OSWAAAL CBSE Laboratory Manual Physics



## Class 12

### Highlights

1. Strictly as per latest CBSE guidelines.
2. Includes all Activities / Experiments specified in latest CBSE curriculum.
3. Includes 'Viva Voce' Questions for each activity / experiment.
4. High Quality figures for overall understanding of the concepts.
5. Projects to facilitate collective efforts and extension of learning to real life situations.
6. Brief description of each Activity / Experiment given as 'Theoretical Concepts'.

 **OSWAAL**  
**LABORATORY**  
**MANUAL**  
**in**  
**PHYSICS**

**Class**  
**12**

Name .....

School .....

Class..... Section .....

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## PREFACE

CBSE always believe in Global Trends of Educational Transformation. The CBSE curriculum gets its lead from National Curriculum Framework - 2005 and Right to Free and Compulsory Education Act - 2009. As said by John Holt “We learn to do something by doing it. Laboratory work has special importance in the learning of science as scientific principles develop and grow on the basis of Laboratory work.

The Physics Lab Manual for Classes XI & XII has been written so as to supplement the need of the students to prepare for lab work and improve practical skills among students.

This Lab Manual includes all activities and experiments as specified in latest CBSE curriculum. Each activity/experiment comprises of theoretical concepts which provides brief description about activities. At the end of every activity Viva Voce questions have been given for extra practice. Projects have been added to facilitate collective efforts and extension of learning to real life.

This book is strictly according to the latest CBSE guidelines, and contains more than sufficient viva voce questions and brief description of each activity/experiment, which help students in practicing and completing the lab work. All activities and experiments are always checked twice. Practically, this book provides students everything they need to learn during their lab work. Since we believe in continuous improvement, hence this book has been written with accuracy as well as updated as per CBSE guidelines and reviewed at different tiers by panel of experts.

We are sure that this book will serve as a perfect teaching guide for the teachers and good lab manual for the students. It is expected that they will take full advantage of our knowledge and experience.

At last we would like to thank our authors, editors, reviewers and specially students who regularly send us suggestions which helps in continuous improvement of this book and makes this book stand in the category of “One of the Best”. Wish you all Happy Learning.

-Publisher

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Activity 4 : To assemble the components of a given electrical circuit.

Activity 5 : To study the variation in potential drop with length of a wire for a steady current.

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Experiment 4 : To find the focal length of a concave lens with the help of a convex lens.

Experiment 5 : To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.

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Activity 3 : To study effect of intensity of light (by varying distance of the source) on an LDR (Light Dependent Resistor).	
Activity 4 : To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.	
Activity 5 : To observe polarization of light using two Polaroids.	
Activity 6 : To observe diffraction of light due to a thin slit.	
Activity 7 : To study the nature and size of the image formed by a (i) convex lens, (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).	
Activity 8 : To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.	

# Activities

## LIST OF EXPERIMENTS

Practicals should be conducted alongside the concepts taught in theory classes.

Sr. No.	Experiment	Date	Page	Remarks
<b>Practicals</b>				
<b>Evaluation Scheme for Examination</b>		<b>Marks</b>		
Two experiments one from each section		8+8		
Practical record (experiment and activities)		6		
Investigatory project		3		
Viva on experiments, activities and project		5		
<b>Total</b>		<b>30</b>		
<b>Section-A : Experiments</b>				
<ol style="list-style-type: none"> <li>To determine resistance per cm of a given wire by plotting a graph for potential difference versus current.</li> <li>To find resistance of a given wire using metre bridge and hence determine the resistivity (specific resistance) of its material.</li> <li>To verify the laws of combination (series) of resistances using a metre bridge.</li> <li>To verify the laws of combination (parallel) of resistances using a metre bridge.</li> <li>To compare the EMF of two given primary cells using potentiometer.</li> <li>To determine the internal resistance of given primary cell using potentiometer.</li> <li>To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.</li> <li>To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same.</li> <li>To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.</li> <li>To find the frequency of AC mains with a sonometer.</li> </ol>				
<b>Activities – For the purpose of demonstration only</b>				
<ol style="list-style-type: none"> <li>To measure the resistance and impedance of an inductor with or without iron core.</li> <li>To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given circuit using multimeter.</li> <li>To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.</li> <li>To assemble the components of a given electrical circuit.</li> <li>To study the variation in potential drop with length of a wire for a steady current.</li> <li>To draw the diagram of a given open circuit comprising at least a battery, resistor/rheostat, key, ammeter and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.</li> </ol>				
<b>Section-B : Experiments</b>				
<ol style="list-style-type: none"> <li>To find the value of <math>v</math> for different values of <math>u</math> in case of a concave mirror and to find the focal length.</li> <li>To find the focal length of a convex mirror, using a convex lens.</li> <li>To find the focal length of a convex lens by plotting graphs between <math>u</math> and <math>v</math> or between <math>1/u</math> and <math>1/v</math>.</li> <li>To find the focal length of a concave lens, using a convex lens.</li> <li>To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.</li> <li>To determine refractive index of a glass slab using a travelling microscope.</li> <li>To find refractive index of a liquid by using convex lens and plane mirror.</li> <li>To draw the I-V characteristic curve for a p-n junction in forward bias and reverse bias.</li> <li>To draw the characteristic curve of a zener diode and to determine its reverse break down voltage.</li> <li>To study the characteristic of a common - emitter npn or pnp transistor and to find out the values of current and voltage gains.</li> </ol>				
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## Chapter 1

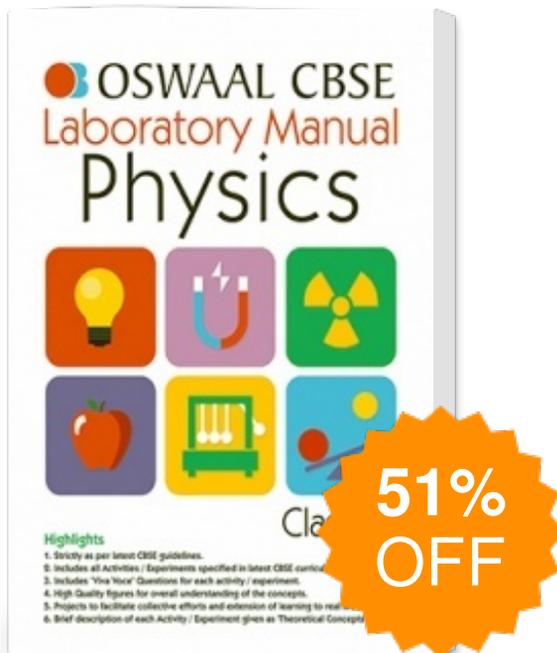
## Ohm's Law

 CONCEPTS

- In order for electricity to flow, it must follow a complete path.
- **Circuit** : The path that electricity can move through is called a circuit.
- The electricity that flows through a circuit is called current electricity. Current electricity is moving electrical charge.
- **Closed circuit** : Current electricity only flows through a closed circuit. In a closed circuit, there are no gaps or break in the path. The path is complete.
- **Open circuit** : An incomplete path is called an open circuit. There are gaps or breaks in an open circuit. No current will flow in an open circuit.
- The amount of current flowing through a circuit is measured in units called amperes.
- Current is measured with an instrument called an ammeter.
- **Resistor** : Current does not flow easily through a resistor. Resistors allow electrical energy to be changed into other forms of energy.
- The filament in a light bulb is a resistor. The resistor in the light bulb allows electrical energy to be changed into heat and light energy as current flows through then.
- Current always flows through the path of least resistance.
- Sometimes the path of least resistance is a side circuit of very low resistance that happens by accident. This is called a short circuit.
- A short circuit is dangerous because in such a situation, too much current flows through the wires so that they can heat up and cause fire.
- **Dry cell** : The positive terminal is attached to carbon rod. The negative terminal is attached to the zinc container. A chemical change in the cell makes the container more negatively charged. The carbon rod becomes more positively charged. Chemical reaction produce negative charges. When wires are connected to the terminals, the current flows. Negative charges travel through the conductor to the positive terminal.
- **Wet Cell** : Contains a copper bar and a zinc bar placed in a liquid.
- **Fuse** : A fuse helps to protect the circuits at homes by preventing too much electrical current from flowing through the wires. A fuse has a thin metal strip which is a resistor. If a dangerously high current flows through the fuse, the metal strip heats up and at a high temperature, the strip melts which creates an open circuit and shuts down the flow of electricity.
- **Circuit breaker** : Most of the homes are built with circuit breakers. A circuit breaker is a switch that protects circuit. When a dangerously high current flows through the switch, the metal gets heated. The overheated metal in the switch expands. This



# Oswaal CBSE Laboratory Manual For Class 12 Physics



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