

# **Objectives of Physics for first year secondary**

## **Electricity**

### **Electrostatics**

- Identify the two types of charges.
- Explain how a neutral object can be charged.
- Distinguish between conductors and insulators.
- State and apply Coulomb's law.

### **Potential difference**

- Explain the notion of electric potential difference.
- Measure a potential difference.
- Apply the laws of potential difference.

### **Electric current**

- Know what an electric current is.
- Measure an electric current.
- Apply the laws of electric current.

### **Resistors**

- Explain the notion of electric resistance.
- Measure the resistance of a resistor.
- Apply Ohm's law for a resistor.
- Apply the laws of grouping of resistors.
- Apply Joule's law.

### **Generators and Receivers**

- Define a generator and a receiver.
- Know the characteristics of a generator and a receiver.
- Draw and read the current – voltage characteristics of a generator and of a receiver.
- Apply Ohm's law to a generator and to receiver.

### **Electric Circuits**

- Set up a circuit represented by a diagram and vice – versa.
- Apply the laws of potential difference and current in an electric circuit.

## **Waves**

### **Vibrations and waves**

- Distinguish between a vibration and a wave.
- Know that waves transport energy but not matter.
- Know the characteristics of a traveling wave.
- Distinguish between mechanical and electromagnetic waves.

### **Reflection and Refraction of waves**

- Distinguish between reflection and refraction of waves.
- Define the index of refraction.

## **Optics**

### **Propagation of light**

- Know that light propagates in straight lines.
- Identify different types of beams of light.
- Distinguish between an object and an image.
- Identify real and virtual images.

### **Reflection of light**

- State and apply the laws of reflection.
- State and apply the principle of reversibility of light.
- List the characteristics of the image given by a plane mirror.
- Compare the fields of vision of plane and convex mirrors.

### **Refraction of light**

- State and apply the laws of refraction.
- Know the condition for total internal reflection.
- Interpret the phenomenon of dispersion.

### **Lenses**

- Define a lens and know its characteristics.
- Distinguish between converging and diverging lenses.
- Determine the characteristics of the image given by a lens.
- Apply Descartes' lens formulas.

## **Mechanics**

### **Description of motion**

- Choose a frame of reference.
- Distinguish between average speed and instantaneous speed.
- Distinguish between speed and acceleration.
- Represent the velocity and acceleration by vectors.

### **Rectilinear motion**

- Know the characteristics of a uniform rectilinear motion.
- Know the characteristics of a uniformly accelerated rectilinear motion.
- Determine the characteristics of a motion from its graph.

### **Force and interaction**

- Know the effects of a force.
- Know that a force is due to an interaction between two bodies.
- Draw a free body diagram of forces acting on a body.
- Find the resultant of two concurrent forces.

### **Newton's laws.**

- State and apply the three laws of Newton.
- State and apply the law of gravitational interaction.
- Know the variation of  $g$  with altitude.