

# PHYSICS FORM 3

Textbooks: *Physics for You*

## FIRST TERM

### **Reflection of light**

	<b>Notes</b>	<b>Book</b>
Light as a form of energy	1.1	
Light waves and speed of light	1.2	p. 173
Sight and light	1.3	p. 173
Light beams and rays	1.3	
Light travels in straight lines	1.4	p. 173
Pin hole camera		p. 176
Ray box	1.6	p. 173
Laws of reflection	1.7	p. 178
Regular and irregular reflection	1.9	p. 181
Formation of image by reflection	1.10	
	1.11	
Properties of image formed	1.12	p. 181
	1.13	
Lateral inversion	1.14	
Location of image by Parallax method	1.17	
How to read pointer instruments	1.18	
The periscope		p. 179
Rotation of reflected ray on rotation of mirror	1.21	
The ability to construct ray diagrams is very important and so some simple practical applications are important, such as pepper's ghost and minimum size of image to see the whole of oneself	1.20	p. 180

**Experiments:** 1. investigating laws of reflection using ray plotting method.  
 2. location of image by parallax method.  
 3. Rotation of reflected ray on rotation of mirror.

### **Refraction:**

Bending of light rays due to change in speed	2.1	p. 187
Reason for bending	2.2	
The extent of bending	2.3	
Use the terms angle of incidence and angle of refraction	2.6	p. 186
Internal reflection	2.6	
Describe how an image of a submerged object is formed when light rays are refracted at water air plane boundary		p. 189
Real and apparent depth (qualitative treatment only)	2.11	p. 188
Total internal reflection and critical angle	2.14	p. 189
Use of prisms to deviate light by 90 and 180°	2.17	p. 190
Optical fibres and their use	2.20	pp. 191,194

**Experiments:** To investigate refraction by a rectangular glass block  
 (2 experiments one using ray plotting the other using pins)  
 To find the critical angle using a semicircular glass block.

### **Refraction through lenses**

Lenses as pieces of transparent materials with curved surfaces.	3.1	p. 196
Describe the action of a thin converging lens on a beam of light.	3.3	p. 196
Principal axis, principal focus and focal length	3.4+ 3.5	
Refraction of rays	3.6	
Construction of ray diagrams to illustrate the form action of real and virtual images.	3.7	p. 196
The power of a lens	3.10	p. 197
Rough estimate of focal length	3.11	
Determination of focal length using simple experiments	3.12	
Magnification	3.13	p. 197
The lens camera, projector and magnifying glass	3.15	pp. 200, 201,208

**Experiments:** Demonstrating refraction by lenses using a biconvex flat glass block.  
Finding focal length using plane mirror method.  
Studying relationship between object and image distance.  
Studying relationship between magnification and object distance.

### **SECOND TERM**

<b>Dispersion:</b>	4.1	p. 210
colour, the visible spectrum	4.2	p. 210
Dispersion using prism (impure spectrum)	4.3	p. 211
Pure spectrum and its production	4.4	p. 210
<b>General properties of matter:</b>		
The three states of matter:	5.1	p. 15
Solid, liquid and gas: spacing and movement of constituent particles:	p. 15	
Brownian motion	5.2	p. 16
Length. Use and describe the use of rulers and measuring cylinders to determine a length or a volume.		
Mass. Use and describe the use of balances including an electronic balance to determine mass of an object.	p. 7	
Density: Its variation with temperature		pp. 82-83
Problems in Mass, volume and density.		
Stretching materials: Describe how extension varies with applied force for a range of materials.	5.3	pp. 73-75
Understand the meaning of Elastic limit	5.4	pp. 73-75
Describe the behaviour of a helical spring and a rubber band when subjected to an increasing force, including Hooke's Law.	5.4	pp. 73-75
Simple problems on stretching forces and extension produced.		

**Experiments:** Determination of density for regular, irregular solids and liquids.  
Demonstrating Brownian Motion in gases.  
Studying how extension varies with applied force for (a) a spring (b) a rubber band

### **Heat and Temperature:**

Difference between heat and temperature	6.1	p. 26
Thermometres	6.2	pp. 28-29
Liquid in glass	6.2	pp. 28-29
Types of thermometer	6.3	
Clinical thermometer	6.4	pp. 28-29
Simple treatment of thermocouple	6.5	
Expansion of solids	6.6	pp. 21-23
Electric thermostat and its use	6.7	p. 24
Demonstrating expansion in liquids	6.8	p. 25
Effect of expansion on volume and density	6.9	p. 25
Anomaly of water	6.10	p. 25

### **THIRD TERM**

Heat as form of energy and energy transfer due to difference in temperature.		
Specific heat capacity	6.11	pp. 37-39
Use of Equation: Energy transfer = mass x specific heat capacity x temperature change	6.11	pp. 37-39
Describe experiments by which S.H.C. of a liquid and a solid may be determined using a heater of known power	6.12	
Evaporation	6.13	pp. 58-60
Factors affecting rate of evaporation	6.14	pp. 58-60
Evaporation causes cooling	6.15	pp. 58-60
Rate of heat loss and cooling under different conditions.	6.16	pp. 58-60
Simple treatment of changes in state	6.16	pp. 55, 57
Transfer of heat		
Conduction	6.17	
Conductors and insulators: examples and uses	6.19	pp. 43-45
Convection: appreciate that convection currents in gases and liquids involve movement of the fluid due to differences in density.	6.21	pp. 46-47
Examples of convection in everyday life	6.22	pp. 46-47
Natural convection in the air	6.23	p. 47
Understand that everyday objects radiate energy in the form of waves(infra red) which form part of Electro- magnetic spectrum.	6.25	pp. 48-53
Appreciate that the power radiated increases with increase in temperature.	6.26	pp. 48-53
Good absorbers and Good emitters	6.27	pp. 48-53
Bad absorbers and Bad emitters.	6.28	pp. 48-53
Identify and explain some of the everyday applications and consequences of heat radiation including "green house effect."	6.29	
The fridge, solar water heaters and car radiator can be used to explain "The transfer heat" by conduction, convection and radiation.	6.30	pp.52, 53, 61

<b>Experiments:</b>	Comparing conductivities in solids
	Demonstrating convection
	Cooling under different conditions
	Absorbtion of heat and nature of surface
	S.H.C. of solid, S.H.C of liquid
	Cooling curve for wax or naphthalene

## ASSESSMENT MARK DESCRIPTION

<b>TERM</b>	<b><i>Classwork/ Homework (40%)</i></b>	<b><i>Practical Work (20%)</i></b>	<b><i>Effort (20%)</i></b>	<b><i>Participation (10%)</i></b>	<b><i>Behaviour (10%)</i></b>	<b><i>TOTAL MARK (100%)</i></b>
<b>November</b>	4	2	2	1	1	<b>10</b>
<b>Mid Year</b>	8	4	4	2	2	<b>20</b>
<b>Annual</b>	8	4	4	2	2	<b>20</b>