OPTICS

Experiment Manual

• simple
• fast
• safe

DL720-1CE
OPTICS

Diffusion of Light
O 1 Light spreads in a straight line
O 2 Punctual sources of light produce sharp shadows
O 3 Diffuse sources light produce indistinct shadows
O 4 Eclipse of the moon (model)
O 5 Eclipse of the sun (model)

Reflection
O 6 The Law of Reflection
O 7 A mirror is rotated
O 8 Regular reflection
O 9 Diffuse reflection of light - diffraction
O 10 Position of an image point on a plane mirror
O 11 Creating a virtual image on a smooth mirror
O 12 Concave mirror as a light collector
O 13 Model of a headlight
O 14 Path of rays in a concave mirror
O 15 Images in a concave mirror
O 16 Movement of rays in a convex mirror
O 17 Path of rays in a convex mirror
O 18 Path of rays when forming an image in a convex mirror

Refraction
O 19 Refraction of light viewed qualitatively
O 20 Angle of incidence and angle of refraction
O 21 Refraction from the perpendicular – total reflection in water
O 22 Refraction to the perpendicular
O 23 Calculating the index of refraction
O 24 Refraction from the perpendicular – total reflection in glass
O 25 Total reflection in a semi-circular body
O 26 Basic principle of a photoconductor
O 27 Photoconductor, flexible
O 28 The plane parallel plate
O 29 Refraction of light in a prism
O 30 Deviating prism
O 31 Inverting prism
O 32 Torricelli's prism

Lenses
O 33 Refractive effect of a convergent lens
O 34 Refractive effect of a divergent lens
O 35 Position of the focal point of a biconvex lens
O 36 Position of the focal point of a thin planoconvex lens
O 37 Position of the focal point of a thick planoconvex lens
O 38 Refractive effect of convergent and divergent lenses on diverging light rays
O 39 Lens systems
O 40 Special rays on a convergent lens
O 41 Special ray paths on a planoconvex lens
O 42 Special ray paths on a concave lens
O 43 Path of rays when forming an image on a convergent lens
O 44 Path of rays when forming an image on a divergent lens

The Eye
O 45 Ocular accommodation
O 46 Faulty vision and its correction – near-sightedness
O 47 Faulty vision and its correction – far-sightedness
Optical Instruments

O 48 Path of rays in a single lens reflex camera
O 49 Path of rays in a slide projector
O 50 Model of a magnifying glass
O 51 Model of a microscope
O 52 Model of an astronomical telescope
O 53 Model of a Galilean telescope

Color

O 54 Dispersion of color
O 55 Spectral colors cannot be further dispersed
O 56 Converging spectral colors to make white
O 57 Mixed color of a partial spectrum
O 58 Complementary colors – color theory
O 59 Subtractive mixture of colors
O 60 Additive mixture of colors

Note:

⬆️ ● This symbol on the fan light means that the pin in the light must be pulled out in order for the light to be emitted divergently.
LIGHT SPREADS IN A STRAIGHT LINE

Apparatus:

1 Complete assembly panel
1 Magnetic xenon light
1 Shutter with 1 and 2 slits
1 Shutter with 3 and 5 slits

1 Planoconvex model lens
2 Connecting wires
Power supply

With the pin inside, a parallel light beam is emitted. When shutters with one, two or three slits are applied, the same number of thin light beams, parallel to one another, are generated. These are called light rays.

When the pin is pulled out, a divergent light beam is emitted, otherwise known as a cone of light. When shutters with slits are applied, divergent rays of light are created.
Placing a planoconvex lens in front of the light turns the divergent light beam into a parallel one.

Moving the planoconvex lens toward the source of light causes a divergent light beam while moving it away from the light source causes a convergent one.

The insertion of a shutter with three slits causes individual light rays to be created.
SUBTRACTIVE MIXTURE OF COLORS

Apparatus:

*Color filters, subtractive, set of 3*

The three color filters with the subtractive primary colors cyan, magenta and yellow are partially overlapped and held against a bright surface.

Where the filters overlap, the additive primary colors red, blue and green can be observed.
ADDITIVE MIXTURE OF COLORS

Apparatus:

1 Complete assembly panel  
1 Magnetic xenon light  
1 Three-color filter, additive, red, blue, green  
1 Projection wedge  
1 Set of 3 demonstration mirrors  
2 Connecting wires  
Power supply

The three-color, additive filter is inserted in front of the magnetic lamp. The pin being pulled out, the light projects a divergent light beam in the three additive primary colors red, green and blue.

Using the three mirrors, the three colored beams are made to overlap on the projection surface.

This results in the three subtractive primary colors cyan, magenta and yellow being produced.

White results where all three additive colors overlap.