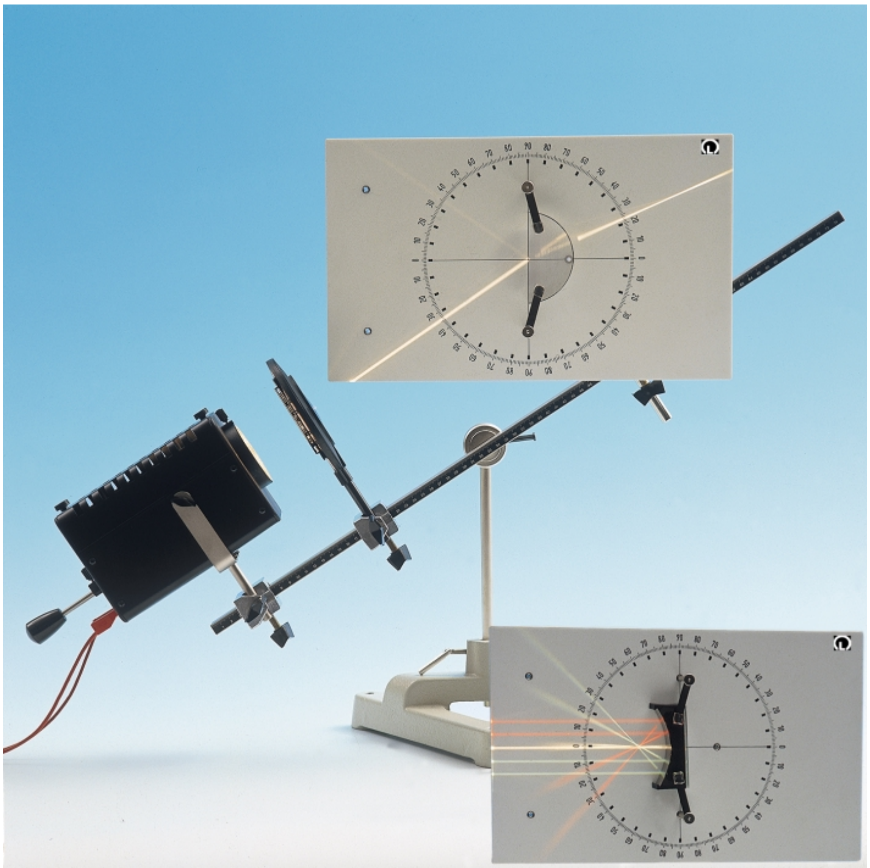

Refraction (reflection) of light (P 5.1.1.1, P 5.1.1.2)

P 5.1.1

Reflection, refraction

P 5.1.1.1 Reflection of light at straight and curved mirrors
P 5.1.1.2 Refraction of light at straight surfaces and investigation of ray paths in prisms and lenses

Cat. No.	Description	P 5.1.1.1–2
463 52	Optical disk with 8 model objects	1
450 60	Lamp housing	1
450 51	Lamp, 6 V/30 W	1
521 210	Transformer, 6 V AC, 12 V AC/30 VA	1
460 43	Small optical bench	1
463 51	Diaphragm with 5 slits	1
460 08	Lens f = + 150 mm	1
300 01	Stand base, V-shape, 28 cm	1
301 01	Leybold multiclamp	4
300 41	Stand rod, 25 cm	1

Frequently, the propagation of light can be adequately described simply by defining the ray path. Examples of this are the ray paths of light in mirrors, in lenses and in prisms using sectional models.

The first experiment examines how a mirror image is formed by reflection at a plane mirror and demonstrates the reversibility of the ray path. The law of reflection is experimentally validated:

$$\alpha = \beta$$

α: angle of incidence, β: angle of reflection

Further experiment objectives deal with the reflection of a parallel light beam in the focal point of a concave mirror, the existence of a virtual focal point for reflection in a convex mirror, the relationship between focal length and bending radius of the curved mirror and the creation of real and virtual images for reflection at a curved mirror.

The second experiment deals with the change of direction when light passes from one medium into another. The law of refraction discovered by *W. Snell* is quantitatively verified:

$$\frac{\sin\alpha}{\sin\beta} = \frac{n_2}{n_1}$$

α: angle of incidence, β: = angle of refraction,
n_1: refractive index of medium 1 (here air),
n_2: refractive index of medium 2 (here glass)

This experiment topic also studies total reflection at the transition from a medium with a greater refractive index to one with a lesser refractive index, the concentration of a parallel light beam at the focal point of a collecting lens, the existence of a virtual focal point when a parallel light beam passes through a dispersing lens, the creation of real and virtual images when imaging with lenses and the ray path through a prism.