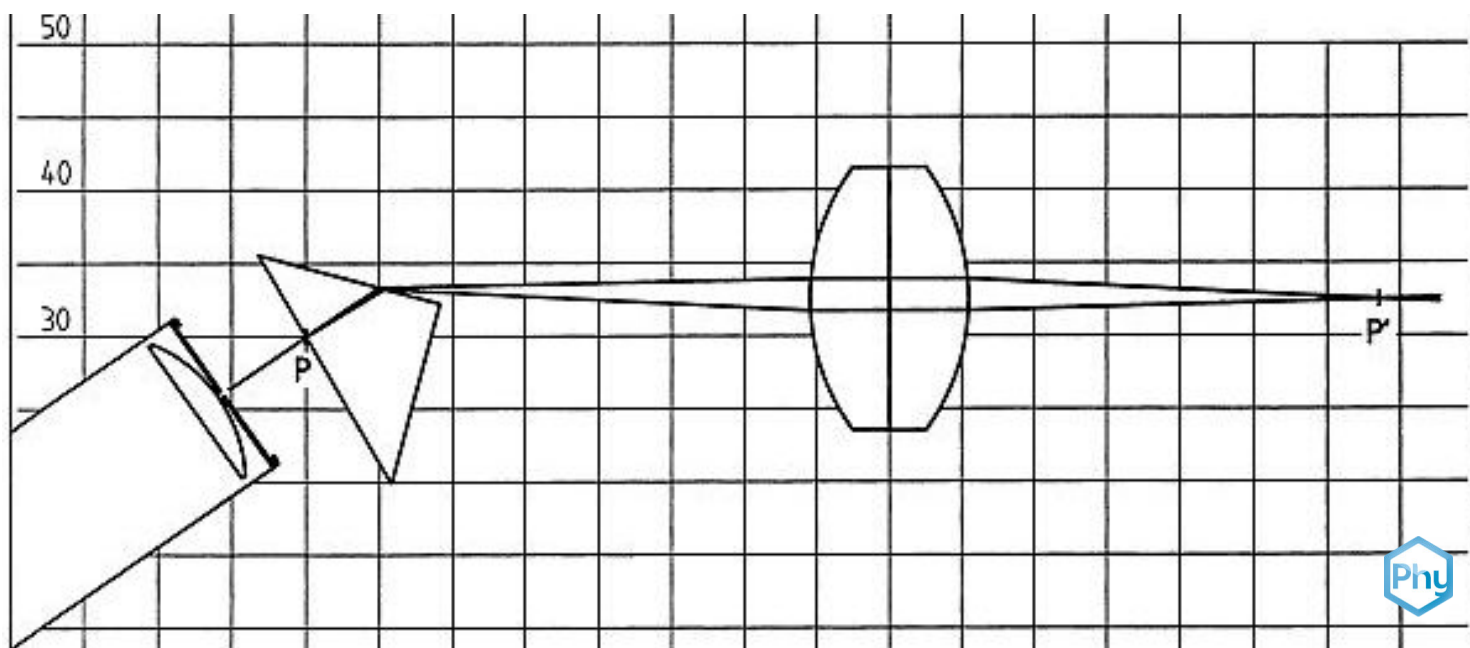


Unification of the spectral colors



spectral color union

Physics

Light & Optics

Light & Colour



Difficulty level

easy



Group size

1



Preparation time

10 minutes



Execution time

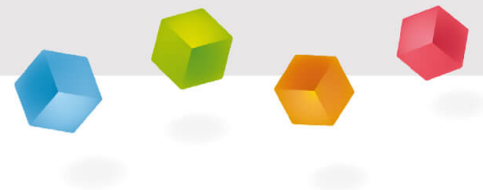
10 minutes

This content can also be found online at:



<http://localhost:1337/c/616d55d8aeb0ac0003430afb>

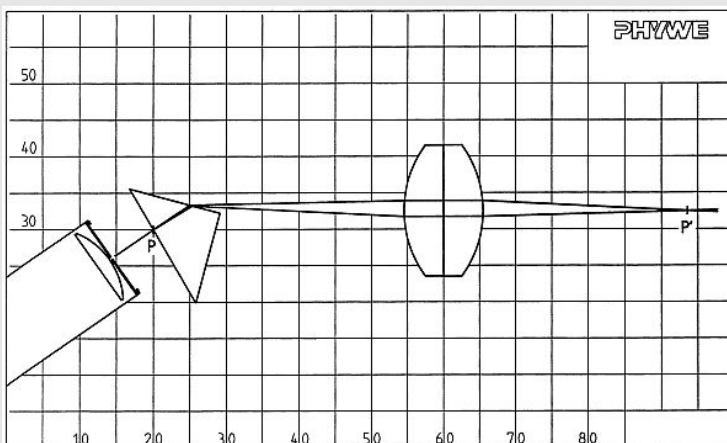
PHYWE



Teacher information

Application

PHYWE



Experimental setup:

1 slit diaphragm with prism and converging lens

The underlying experiment is to show the unification of spectral colors.

By breaking the beams with the aid of a converging lens, they are reunited to form a white beam.

However, the white beam exists only in the focal point. To obtain it, the light must be "processed" again from the focal point.

Other teacher information (1/2)

PHYWE

Previous



Students need prior knowledge of converging and diverging lenses, and how they behave under different incidences of light.

Principle



It is to be shown that the spectral colors can be reunited to white light with the help of a converging lens.

Other teacher information (2/2)

PHYWE

Learning



Students will develop a sound knowledge of image construction.

Tasks



The students should observe the experiment and learn which concepts and properties are of high importance for the construction of the image.

Additional teacher information

PHYWE

Note



If you remove the 1-slit diaphragm and use a wide parallel light beam (e.g. 6 mm wide) by means of the two diaphragms with holder, you can demonstrate the phenomena more clearly. The blurring of the spectrum, which must then be accepted, is not a problem in this experiment.

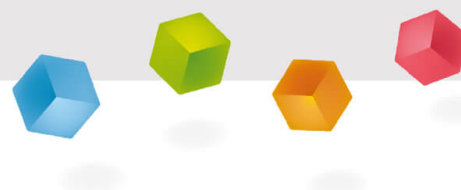
Safety instructions

PHYWE



- The general instructions for safe experimentation in science lessons apply to this experiment.

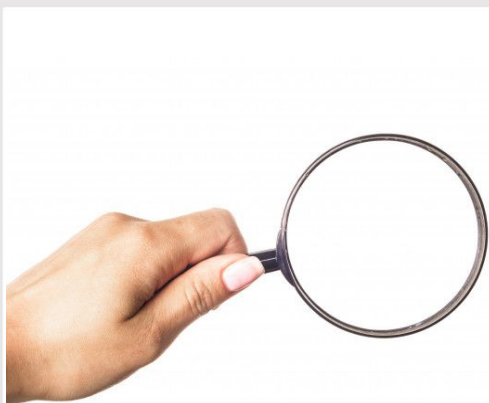
PHYWE



Student Information

Motivation

PHYWE



Magnifier

In previous experiments, dispersion, the decomposition of a light beam, was explained.

With the help of a magnifying glass it is possible to reverse this dispersion.

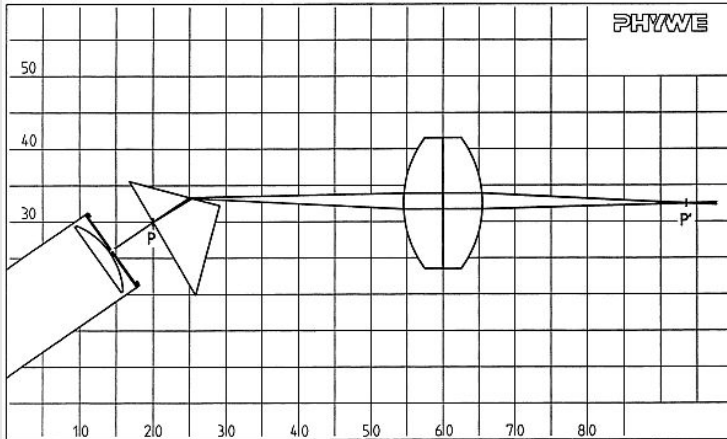
The experiment is intended to show how this works.

Equipment

Position	Material	Item No.	Quantity
1	PHYWE Demo Physics board with stand	02150-00	1
2	Halogen lamp for experiments, 12V/50W, with magnetic base	08270-20	1
3	Opt. block,planoconvex, magn.held	08270-02	2
4	Opt. block,triangular,magnet held	08270-06	1
5	PHYWE Multitap transformer DC: 2/4/6/8/10/12 V, 5 A / AC: 2/4/6/8/10/12/14 V, 5 A	13533-93	1

Structure and implementation

PHYWE

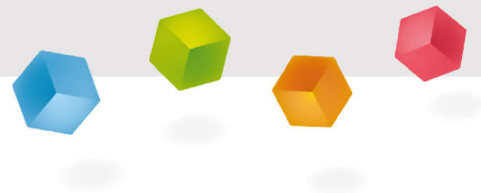


1 slit diaphragm with glass prism and converging lens

- 45° - Put on prism
- Rotate the prism a little, so that a well visible spectrum is created
- Use a converging lens (biconvex lens) to reunite a coloured light beam at a point P'; to do this, move the lens until the point P' (image of the point P) appears in focus
- View color at point P'
- If necessary, hold a sheet of white paper in the vicinity of P'.

PHYWE

Report



Task 1

PHYWE

Drag the correct words into the gaps!

The created by the of white light can be into a beam of light by .

white

reunited

dispersion

collective lensing

spectral colors

☒ Check

Task 2

PHYWE

The bundled white light immediately continues as a white beam when it exits the lens.

☐ True☐ False☒ Check

After focusing the light into a focal point, the beam diverges again.

☐ True☐ False☒ Check

Slide	Score / Total
Slide 12: Dispersion	0/5
Slide 13: Multiple tasks	0/2

Total   0/7

 Solutions

 Repeat