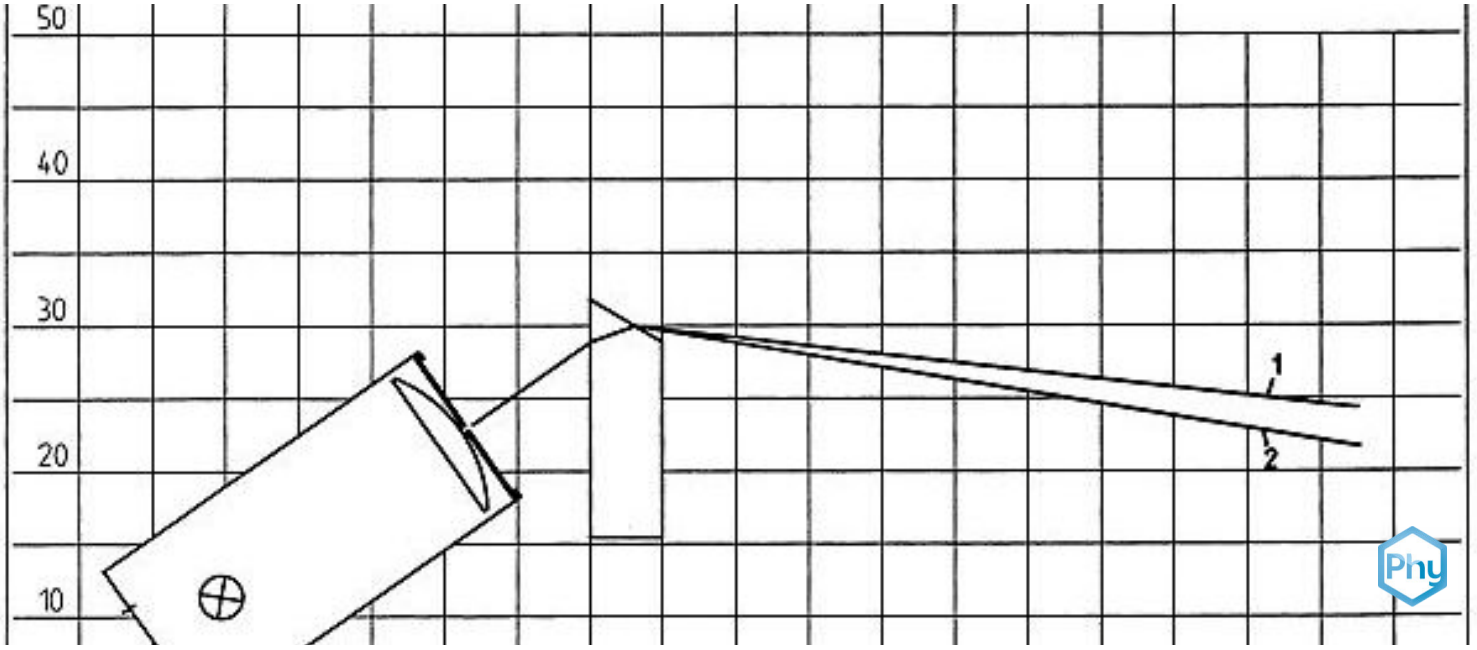
Color separation with a prism (dispersion)



Color separation with a prism (dispersion)

Physics > Light & Optics > Light & Colour

Difficulty level	Group size	Preparation time	Execution time
easy	1	10 minutes	10 minutes

This content can also be found online at:

http://localhost:1337/c/616d554aaeb0ac0003430af3

PHYWE

Teacher information

Application

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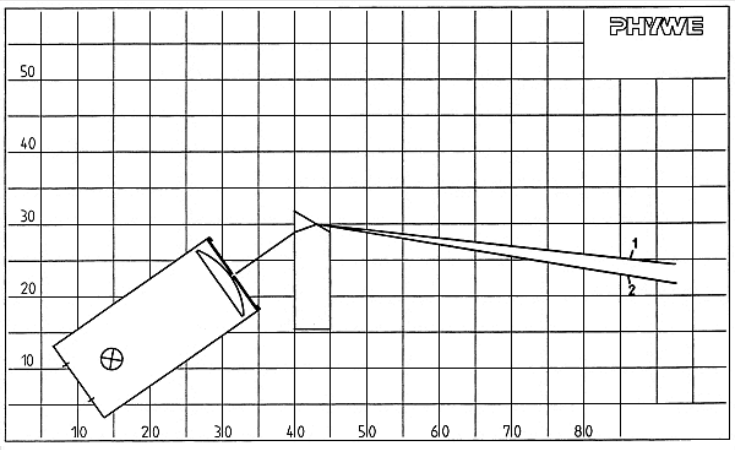

Experimental setup:

1 slit diaphragm with prism

The underlying experiment is intended to demonstrate color decomposition or dispersion using a glass prism.

The students should be shown that a white beam of rays is broken down into spectral colors as it passes through a prism.

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Other teacher information (1/2)

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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 white light is broken down into spectral colors when it passes through a prism.

Other teacher information (2/2)

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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.

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Additional teacher information

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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 one must then accept, does not interfere with this experiment.

Safety instructions

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

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Student Information

Motivation

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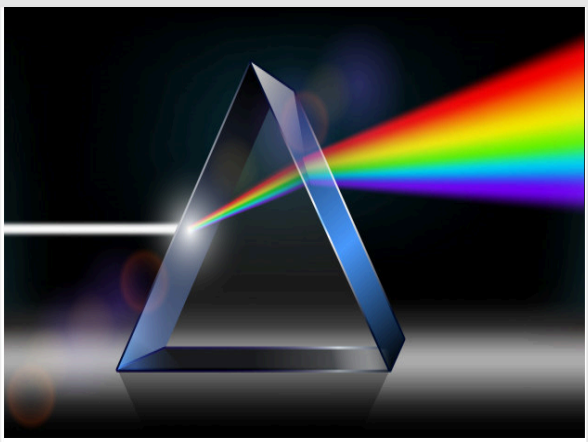

Glass prism refracts light into spectrum

On the left side you can see how a glass prism apparently creates a rainbow.

In fact, rainbows are created in a very similar way; the light of the sun, which is almost white for us, is broken down into its spectral colours in raindrops and appears from red to violet in the familiar rainbow colours.

The underlying experiment is intended to explain color decomposition (dispersion).

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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,trapeze, magnet held	08270-05	1
4	Diaphragm w. holder, magnet held	08270-10	2
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

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Structure and implementation

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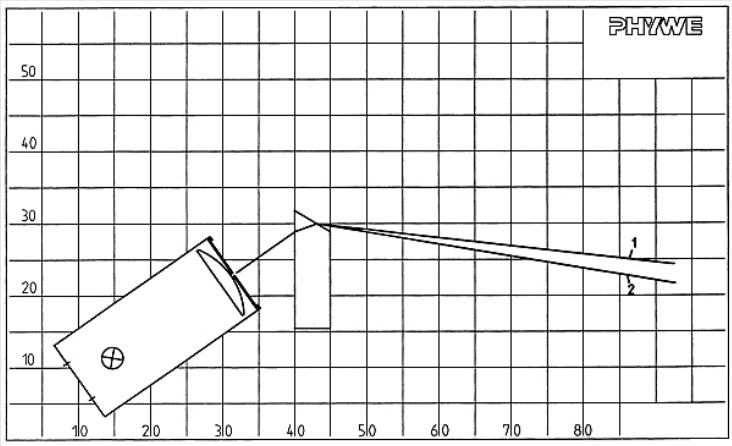

1 slit diaphragm with glass prism

- Attach the holding lamp with 1-gap cover
- 60°- Prism of the model body Trapezoid bring into the light beam, so that the beam path through the prism is approximately symmetrical
- Rotate prism slightly around the point of incidence of the light beam
- Observe the course of the beam, paying particular attention to colour phenomena.

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Report

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Task 1

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Drag the correct words into the gaps!

The _____ light hitting the prism is _____ by the prism to a _____ light bundle, which is _____. For example, the colors red, yellow, green and blue - from _____ to _____ in succession - are recognizable.

fanned out
divergent
above
white
below
colored

Check

Task 2

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When passing through a prism, spectral colors are bundled into a white beam.

○ True ○ False

Check

The result is a spectrum that contains an infinite number of colors.

○ True ○ False

Check

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Task 3

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The spectral colors are red, orange, yellow, green, blue, and

- Black
- Purple
- Cyan

Slide	Score / Total
Slide 12: Light on prism	0/6
Slide 13: Multiple tasks	0/2
Slide 14: Spread colors	0/2

Total 0 / 10

Solutions Repeat

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