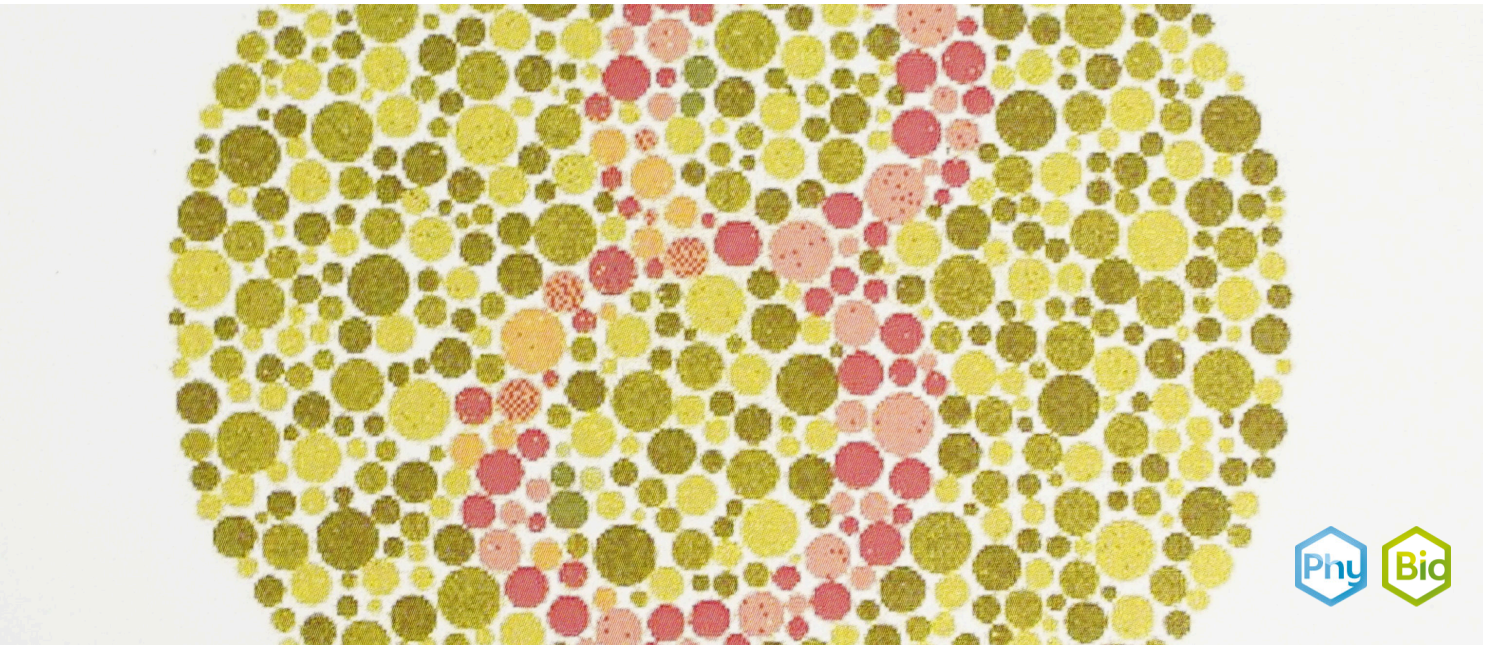
Red-Green Visual Impairment



Physics > Light & Optics > Dispersion of light

Biology > Human Physiology > Hearing & Seeing

Difficulty level	Group size	Preparation time	Execution time
-	-	-	-

This content can also be found online at:

https://www.curriculab.de/c/6717894f2787770002d59b49

PHYWE
Robert-Bosch-Breite 10
37079 Göttingen
Tel.: 0551 604 - 0
Fax: 0551 604 - 107
info@phywe.de
www.phywe.de

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Teacher information

Application

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Red and green apples

Red-green deficiency is a common form of colour blindness in which affected people have difficulty distinguishing between the colours red and green. This visual impairment is caused by a change in the so-called cones, the colour-sensing cells in the eye. Normally, these cells are responsible for recognising different colours. This condition is usually congenital and is genetically inherited. Although there is no cure for red-green deficiency, many sufferers learn to cope well in everyday life by using other cues such as the brightness and position of objects to distinguish colours. Red-green deficiency has various effects on daily life, but can be managed well with adaptations and aids.

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Robert-Bosch-Breite 10
37079 Göttingen

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info@phywe.de
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Other teacher information (1/2)

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Prior knowledge

The structure of a human eye should be discussed in class beforehand.

Principle

Red-green vision impairment, also known as red-green colour vision deficiency, is a form of colour blindness in which those affected have difficulty distinguishing between different shades of red and green. This is due to a deficiency or defect in the cones of the eye, the light receptors responsible for perceiving colours. People with normal colour vision have three types of cones that react to red, green or blue light. With red-green colour vision deficiency, the cones for red and green do not function normally.

Other teacher information (2/2)

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Learning objective

The pupils should develop an understanding of the red-green visual impairment.

Tasks

- Pupils learn the meaning and cause of red-green visual impairment.
- They use an Ishihara colour chart to find out whether they have a red-green visual impairment.

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Robert-Bosch-Breite 10
37079 Göttingen

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info@phywe.de
www.phywe.de

Safety instructions

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

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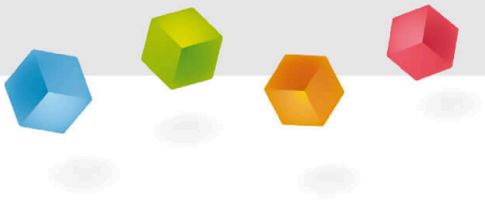

Student information

PHYWE

Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

Motivation

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Traffic lights

Imagine you have a picture that is only displayed in shades of grey. For someone with red-green deficiency, many red and green tones look similar, almost as if they were in different shades of grey. Normally, the eye uses special cells called cones to help recognise colours. With red-green deficiency, some of these cones do not function properly.

Red-green colour blindness is congenital, which means you are born with it. There is no cure, but people with this weakness often learn to deal with it and find ways to distinguish colours in other ways, for example by the brightness or position of objects.

Tasks

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Ishihara cards

- Use Ishihara colour charts to find out whether you have red-green vision loss.

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Robert-Bosch-Breite 10
37079 Göttingen

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Material

Position	Equipment	Item no.	Quantity
1	Card demonstrating a red-green visual impairment	64951-00	1

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Robert-Bosch-Breite 10
37079 Göttingen
Tel.: 0551 604 - 0
Fax: 0551 604 - 107
info@phywe.de
www.phywe.de

Material

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Position	Equipment	Item no.	Quantity
1	Card demonstrating a red-green visual impairment	64951-00	1

Set-up and procedure

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- Place the Ishihara cards on the table.
- Look at the patterns and try to recognise the numbers.

Ishihara test

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Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

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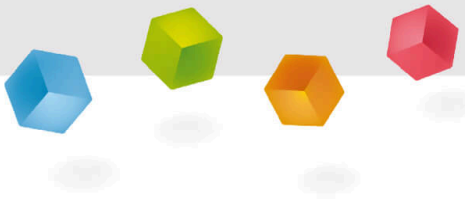

Report

Task 1

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Complete the cloze text.

The _____ test consists of a series of panels with _____ containing numbers or patterns in a different _____. People with _____ colour vision can easily recognise these numbers or patterns, while people with _____ vision have difficulty distinguishing them. The test is often used to detect _____ disorders.

- normal
- red-green
- coloured dots
- Ishihara
- colour vision
- colour

Check

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Robert-Bosch-Breite 10
37079 Göttingen

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info@phywe.de
www.phywe.de

Task 2

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Where does the red-green weakness come from?

- ○ It is caused by environmental factors.
- ○ It is caused by an injury to the eye.
- ○ It is passed on from parents to children.

Check

Which cells in the eye are responsible for recognising colours?

- ○ Chopsticks
- ○ Tenon
- ○ Neurons

Check

Task 3

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Complete the text.

For people with a red-green vision impairment, it can be difficult to recognise the colours of [ ] in road traffic. They have to rely on the position of the lights to know whether they should stop or continue driving. Another example is distinguishing between ripe and unripe [ ], as it is difficult to distinguish a red tomato from a green one.

Check

Ripe and unripe tomatoes

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