Colour blindness

People who are colour blind can't see some colours or see them differently from other people. Colour blindness is inherited, affecting more boys than girls. Out of 20 boys, it is likely that one or two will have a colour vision problem.

The term 'colour blindness' is misleading. People who can't see all colours can still see things (other than colour) as clearly as people who are not colour blind. Very few people who are colour blind are blind to all colours. The usual colours that people have difficulty with are greens, yellows, oranges and reds.

Symptoms
The signs that your child may be colour blind include:

- Difficulties recognising and identifying different colours beyond the age of around four years
- Inability to separate things by their colour.

Special eye cells
All the cells and nerve pathways in the eye and brain are present from birth. In the retina, at the back of the eye, there are two types of cells:

- **Rod cells** – these are sensitive to light, but they do not see different colours. We use rod cells to see things around us at night, but only in shades of black, grey and white.
- **Cone cells** – these react to brighter light and help us to see detail in objects. They also pick up colours. There are three types of cone cell, which pick up red, green and blue light respectively. By combining the messages from each set of cone cells, we get the wide range of colours that we normally see. Someone who is colour blind lacks one or more of these types of cone cells.

Colour blindness is inherited
Red–green colour blindness is usually inherited. It occurs in about 8 per cent of males and only about 0.4 per cent of females. This is because the genes that lead to red–green colour blindness are on the X chromosome. Males have only one X chromosome and females have two. The son of a woman who carries the gene has a 50 per cent chance of being colour blind. The mother is not herself colour blind because the gene is recessive. That means that its effect is suppressed by her matching dominant normal gene. A daughter will not normally be colour blind, unless her mother is a carrier and her father is colour blind.

Only five per cent of people who are colour blind have blue colour blindness. This is equal in males and females, because the genes for it are located on a different chromosome. However, colour blindness is not always inherited. It can also be due to a change in the chromosome during development.

Everyday problems
Many tasks that we do each day rely on us being able to separate things by their colour. There are varying degrees of colour defect and the degree of intensity of the light and nearness of the object will also affect this ability. If people are not able to see the difference in colour, they have to rely on other differences which may be harder to pick. For example, a person may only be able to tell red and green traffic lights apart by their position (red above green). On a dark, wet night, this may be difficult to do.

Many people with red–green colour blindness will be able to get a car driver's licence, but may not qualify for a commercial driver's licence or they may have restrictions which mean they cannot drive at night. Certain occupations, such as airline pilots, demand that their workers must have normal colour vision. Some other occupational groups will not allow a worker who is colour blind to do certain work – for example, where wiring or warning lights are colour coded.

Vision tests
If a lot of tasks at school are colour coded, children with colour vision problems may develop learning difficulties. It is often recommended that all children, especially boys, have a routine colour vision check while in the early years of school. Colour vision testing can be done by ophthalmologists (eye specialists) and optometrists, using specially designed charts. Some school health services will also be able to test children's colour vision.

After a problem is found, further testing might be needed to tell just exactly what the problem is, because this will affect whether the person will be able to do certain jobs or be able to get certain types of driving licences.

Treatment
There is generally no treatment to cure colour blindness. However, certain types of tinted filters and contact lenses may help an individual to distinguish different colors better. Optometrists can supply a singular red-tint contact lens to wear on the dominant eye. This may enable the wearer to pass some colour blindness tests, but they have little practical use.

Where to get help

- Your doctor
- Ophthalmologist
- Optometrist

Things to remember

- People who are colour blind usually have difficulty with the colours green, yellow, orange and red.
- Colour blindness is usually inherited and affects more boys than girls.
- Colour blindness is caused by a lack of particular colour-sensitive cells in the back of the eye.

This page has been produced in consultation with, and approved by:

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