

- Most everyday things can be done without colour vision being a problem, but some people with colour vision problems say they have some annoying difficulties such as not being able to see whether fruit such as apricots are ripe.

### What you can do

- All boys should have their colour vision tested when other people in the family are known to have colour vision problems. This testing can be done most easily when a child starts to know numbers (around the time that he starts school) or when he is older. If people on both sides of the family are known to have colour vision problems, all the girls should also be tested.
- Although it is often recommended that all children (especially boys) have a colour vision check while in the early years of school, this is not available in many places.
- In any group of about twenty boys, it is likely that one or two will have a colour vision problem. If, at school, a lot of tasks are colour coded, these boys may have learning difficulties, so it is worth knowing if a child has a colour vision problem so that ways for him to learn can be found that do not rely on colour.
- Colour vision testing can be done by ophthalmologists (eye specialists) and optometrists (opticians) using specially designed charts (including ones called Ishihara colour plates). Some school health services and some doctors will

also be able to test children's colour vision.

- After a colour vision problem is found, further testing might be needed to tell just exactly what the problem is, because this can affect whether the person will be able to do certain jobs or be able to get certain types of driving licences.
- There are many sites on the Internet which have some colour vision checking charts (see link at the end of this pamphlet), but they cannot be relied on like special test charts printed on paper (which have very carefully shaded, as well as coloured spots, lines or other objects). It is best to get your children checked face-to-face.

### Helping children who are colour blind

- It usually helps children to know why they are having problems when others are able to do something easily. They may have begun to think that they are 'stupid', when their eyes just work differently to others.
- If teachers know that a child is colour blind, they may be able to choose ways of teaching and learning that do not need the child to pick colour differences.
- When your child is old enough to read, it may help to write the name of the colour onto coloured pencils so that your child can choose the 'right' one when drawing. This can help a child avoid being teased.

### For more information contact:

- Local community child or school health nurse
- Local family doctor, optometrist or ophthalmologist
- Ngala Helpline  
8:00am–8:00pm 7 days a week  
Telephone (08) 9368 9368  
Outside metro area – Freecall 1800 111 546\*  
[www.ngala.com.au](http://www.ngala.com.au)
- Parenting WA Line  
Freecall 1800 654 432\* (24 hour service)  
[www.dlhc.wa.gov.au/parents](http://www.dlhc.wa.gov.au/parents)

\*Calls made from a mobile may be charged at a timed rate.

#### Internet site:

Colour Blind Awareness and Support Group  
[www.members.optusnet.com.au/~doverton](http://www.members.optusnet.com.au/~doverton)

**This information, along with other child health information, is available in electronic format at [www.healthywa.wa.gov.au](http://www.healthywa.wa.gov.au)**

This document can be made available in alternative formats on request for a person with a disability. Please contact [childcommunity@health.wa.gov.au](mailto:childcommunity@health.wa.gov.au)

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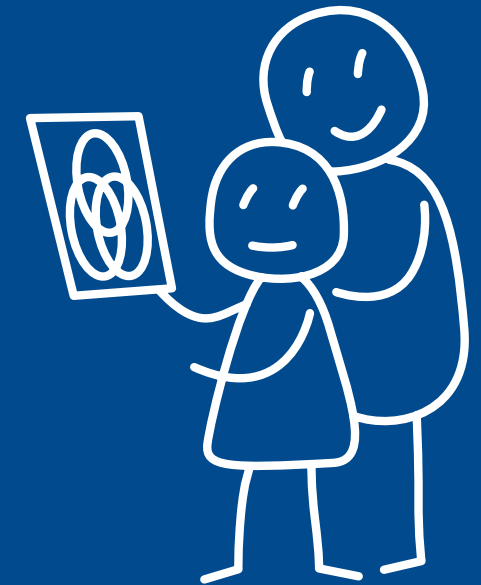
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# colour blindness



The words 'colour blindness' are misleading. People who cannot see all colours are not 'blind' - they can see things as clearly as people who are not 'colour blind'. Colour blindness means that a person cannot 'see' some colours or sees them differently from other people. Very few people who are colour blind are 'blind' to all colours. The usual colours that they see differently are greens, yellows, oranges and reds.

It can be worth knowing if a child is colour blind because he may have difficulty at school, especially in the early years when many activities use colours, such as drawing and sorting blocks. Using a computer can be a problem too for someone who is colour blind.

### When children know colours

- All of the cells and nerve pathways in the eye and the brain are present from birth, and very young children can see the difference between colours if they are not colour blind. They do not see colours very well at first but soon begin to like colours, especially bright colours.
- However, children under about four years may not understand that the 'green' of a ball, for example, is the same colour as the 'green' of grass.
- The child needs more understanding of things like colours, shapes and sizes to 'see' that different things can be the same colour.

- Younger children may be able to say that the ball is green, but not able to say that grass is also green (they know that it doesn't look anything like the ball and are confused when we want them to say the same describing word!).
- Many children are able to recognise and name colours by the time they are four.

### What is colour blindness?

- In the retina at the back of the eye (the part of the eye that picks up light coming in) there are two types of cells, 'rod cells' and 'cone cells', and these react differently to light.
- Rod cells are very sensitive to light and they can react to even very faint light, such as light from a star in a hazy night sky, but they do not 'see' different colours. Using rod cells we can see things around us at night, but only in shades of black, grey and white.
- Cone cells react to brighter light and they help us to see the detail in objects. They also pick up colours.
  - There are three types of cone cells: ones that pick up red light, others green and others blue.
  - By combining the messages from each set of cone cells, we get the wide range of colours that we can normally see.
  - Someone who is colour blind lacks one or more of these types of cone cells.

### Who is colour blind?

- Red-green colour blindness is usually inherited, and occurs in about eight per cent of males and only about 0.4 per cent of females. This is because of the way the genes for the different cone cells are carried on the chromosomes. The genes that lead to red-green colour blindness are on the X chromosome (males have only one of these whereas females have two).
  - If a mother 'carries' the gene for red-green colour blindness (one normal and one altered gene) she will not have a colour vision problem. About 50 per cent of the sons of women who are carriers will be colour blind (in any family it may not be 50 per cent because the distribution of the genes is random).
  - A daughter will not normally be red-green colour blind unless her mother is a carrier and her father is colour blind, but about 50 per cent of daughters of women who are carriers will also carry the gene.
- Only five per cent of people who are colour blind have blue colour blindness, and this is equal in males and females because the genes for it are on a different chromosome (chromosome seven).
- Colour blindness can be due to a change in the chromosome during development. It is not always inherited.

### What problems can it cause?

- Many tasks that we do each day rely on us being able to separate things by their colour. 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). In normal daylight this may be easy to do, but on a dark, wet night it may be much more difficult to know which is which. Similarly, it may be difficult to notice a red brake light on a car. Because of this, there may be restrictions on driving permits. People with certain kinds of red-green colour blindness may be able to get a car driver's licence but not a commercial driver's licence, or they may have restrictions preventing them from driving at night.
- In the classroom, blocks or other teaching tools may be colour coded as well as being of different size. A child with colour vision problems may have to rely on size differences alone.
- On a computer screen, colour is often used for highlighting important words, and the only way some children may know that the words are important is because the shade is slightly lighter or darker.
- Some 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).