What we see is made in the brain from signals given to it by the eyes.

What we see is in fact made in the brain. The brain makes sight from signals given to it by the eyes.

**What is the normal structure of the eye?**

The eye is made of three parts.

- A light focusing bit at the front (cornea and lens).
- A light sensitive film at the back of the eye (retina).
- A large collection of communication wires to the brain (optic nerve).

A curved window called the cornea first focuses the light. The light then passes through a hole called the pupil. A circle of muscle called the iris surrounds the pupil. The iris is the coloured part of the eye. The light is then focused onto the back of the eye by a lens. Tiny light sensitive patches (photoreceptors) cover the back of the eye. These photoreceptors collect information about the visual world. The covering of photoreceptors at the back of the eye forms a thin film known as the retina. The retina lies on a layer of nerves and blood vessels. This layer is called the choroid. The retina and all the photoreceptors need a healthy choroid to work. Each photoreceptor sends its signals down very fine wires to the brain. The wires joining each eye to the brain are called the optic nerves. The information then travels to many different special ‘vision’ parts of the brain. All parts of the brain and eye need to be present and working for us to see normally.

**What Is Toxoplasmosis Of The Eye And What Causes It?**
A germ called toxoplasma can cause infection within the eye. This is known as toxoplasmosis of the eye. The infection causes damage to the eye that can lead to visual impairment.

Many animals are infected with this germ, including cats. The germ is found in the faeces of these infected animals. A person can catch an infection if they eat food dirtied by faeces with the toxoplasma germ. Foods that can lead to an infection include some uncooked meats, unpasteurised milk and raw vegetables. The toxoplasma germ does not survive cooking or boiling.

Most adults do not know they have caught an infection. Most adults do not develop any problems from a toxoplasma infection and do not get toxoplasmosis of the eye. In fact most adults in the UK, if tested, have had a toxoplasma infection at some time in their lives but have normal eyes.

**Toxoplasmosis of the Eye is mainly a problem for Unborn Babies**

If a pregnant mother becomes infected with toxoplasma the germ can also infect the unborn child. A Toxoplasma infection in an unborn child is more serious than in an adult. The infection can cause inflammation and damage to many parts of the body. The eye is often affected (toxoplasmosis of the eye). The most common part of the eye to become affected is the retina and choroid. This is called retinochoroiditis. When the inflammation settles a scar is usually left on the retina.

**How does toxoplasmosis of the eye affect the way a child sees?**

Most young children will feel their vision to be ‘normal’ as they have never known anything else but their own visual world. At first they assume that everyone else has vision the same as their own. They do not realise that other people see things differently.

The toxoplasma germ can cause scarring of any part of the retina. But it tends to cause scarring of the central bit. If this happens then the central part of the vision will also be missing. The child will not usually notice if a part of the retina away from the centre is scarred.
Toxoplasma can affect one or both eyes. If the central bit of the retina in both eyes is scarred then the child will have blurred vision with the central part missing. The vision around the sides will still be OK. This vision is useful for getting around and not bumping into things. The child will however have difficulty reading and recognising faces. Sometimes fast ‘to and fro’ movements of the eyes occur. This is called Nystagmus. Squint may also develop.

Sometimes Toxoplasma can cause other eye conditions

Toxoplasma usually causes inflammation and scarring of the retina and choroid. It can however also cause other eye conditions. These include:

- Clouding of the lens (cataract)
- The eye can be smaller than usual (microphthalmia)
- Loss of some of the communication wires from the optic nerve (optic atrophy)
- Damage to the ‘vision’ parts of the brain (cerebral visual impairment)

Toxoplasma May Cause Other Conditions To Develop

Other conditions can also develop because of a Toxoplasma infection. These include:

- Epilepsy
- Difficulty with hearing
- Learning difficulties
- Blockage of the flow of fluid in the brain (hydrocephalus)

Fortunately most children do not develop these other problems.

How is the diagnosis made?

An eye doctor can recognise the typical pattern of scarring at the back of the eye caused by Toxoplasma. Blood tests may also help.

What can be done to help the eyes?
The scarring and damage caused by the toxoplasma germ does not get better. The retina cannot grow back and fix itself. Usually the scarring does not get any worse. However the toxoplasma germ can stay ‘asleep’ in the retina for many years and ‘wake up’ at any time. If it ‘wakes up’ a new infection can start. Blurred vision and ‘floaters’ are common symptoms of a new infection. It is important to treat any infection quickly to prevent further damage to the retina. Antibiotics and steroid tablets are often used. If treated quickly the blurred vision and floaters usually settle within a few weeks. In some cases the jelly in the eye (vitreous) can become inflammed. This can cause annoying ‘floaters’ that get in the way of vision. In most children the floaters gradually go away with treatment.

Vision can be improved with the use of Low Vision Aids and increasing the size of print.

**How can parents, family, friends and teachers make a difference?**

There is a small risk of a further patch of infection occurring. If it is causing visual problems then vision will be reduced in the affected eye and the child should see an eye doctor as soon as possible. Recurrent inflammation rarely if ever affects both eyes at the same time.

If vision is reduced in both eyes it is important to understand how the child sees and to make up for this.

We use our vision to get around, learn new things and to meet other people and make friends.

Most children with Toxoplasmosis have few problems getting around. The way they act can give the impression that their vision is normal. It is important however to be aware of their own special problems with vision.

Problems at school may be due to some of the reading books being hard to see. This often means it takes longer and more effort to do the work. If the size of print is increased most children will find schoolwork easier.

It is worth watching carefully to find out what the smallest toys are that a child can see and play with. Then try to only play with toys that are the same size or bigger.
Recognising facial expressions can often be difficult. It is worth trying to find out at what distance facial expressions can be seen and responded to. Then always try to talk and smile from within this distance. This helps a child to learn what facial expressions mean and to copy them.

Even if a child has very poor vision many useful and practical things can be done to help. Advice can be given on ways to support your child by your VI teacher or habilitation Specialist.