



Module 2

Vision Screening for Children 4 years and Over



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1. Why is Vision Screening necessary?

Vision screening means testing a child's vision in both of their eyes. A vision test is used to decide if the child can see what they should be able to see for their age. One eye is tested at a time so you know what the child can see in both of their eyes. All children should have their vision screened or tested. Here are some reasons why this is important:

- When a child has an eye problem usually their vision will be affected, so by testing their vision you can find an eye problem that no one knew the child had.
- Many eye and vision problems can't be found just by looking at the child's eyes.
- Children can't tell you that they don't see well - they think the way the world looks is how it's meant to look.
- Children often don't know when they can't see the same amount in both of their eyes. No one may know that they have better vision in one eye than the other – this might only be found when their vision is tested.
- Children's vision develops from the time they are born to about 8 years of age so it is very important that any eye or vision problems are discovered early and treated early so normal vision can be restored.
- Once the vision development time has passed it is very hard to improve the older child's vision even with the right treatment.
- When people get old they can have a lot of eye disease like cataract, glaucoma, diabetic retinopathy and macular degeneration. If they have an eye or vision problem that wasn't treated as a child and then get an adult eye disease they can be left with a vision impairment or blindness as an adult.
- When a child has eye or vision problems this may be linked to other health problems, so by finding out about the child's eyes may mean other health problems are also found and can be treated.



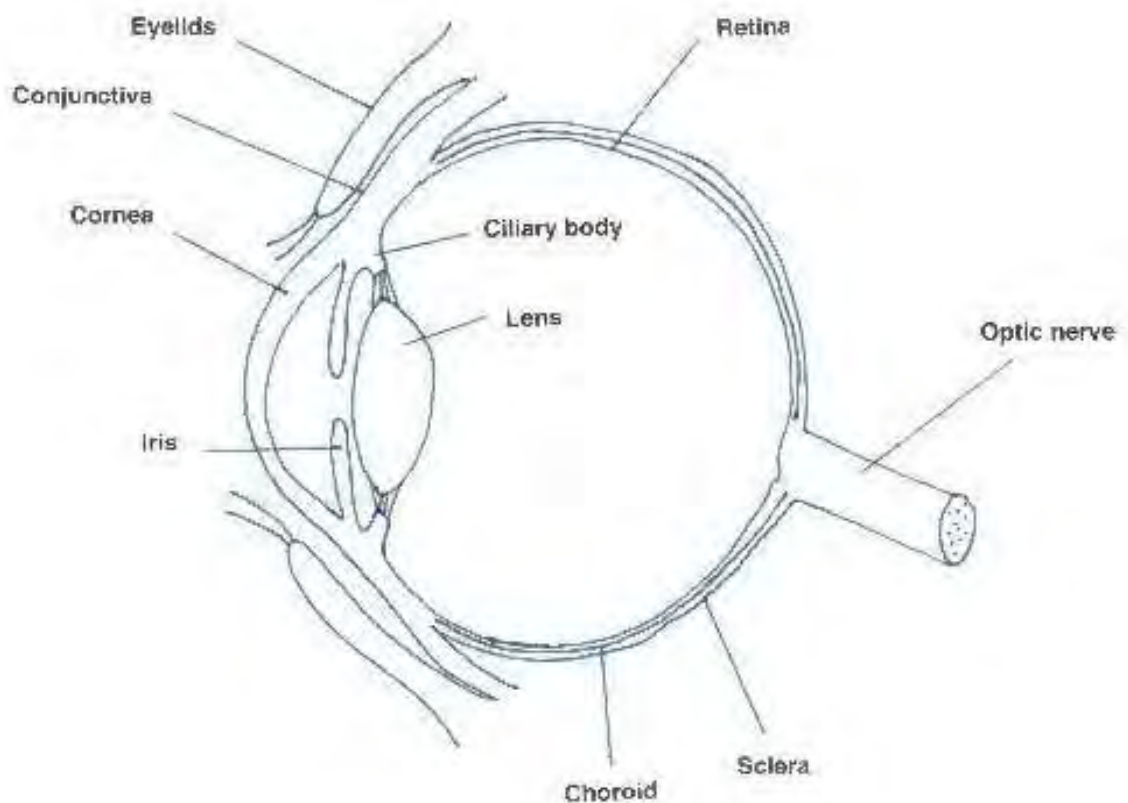
- When a child has vision impairment in both eyes this can affect all areas of their development. By finding and treating an eye or vision problem early their development in other areas can continue.
- When a child has vision impairment in both eyes or blindness there is a good chance they will have other conditions such as hearing loss, cerebral palsy and epilepsy.
- It is possible to accurately test a child's vision from 4 years of age. It would be better to test a child earlier but this isn't always possible as the child might not cooperate or understand what they need to do.



2. How do we See?

It is difficult to fully explain how the eye works and how vision occurs as there is so much we don't understand. Here are some things that we do know:

- The eye starts the process of vision. It collects the image of the outside world and converts it into a microscopic image. The structures within the eye help with this process.



The **eyelids** are folds of skin that cover the eye. They protect the eye by closing when the eye is in danger. The eyelids also keep the front of the eye moist by spreading tears with each blink.

The **conjunctiva** is a clear layer which lies on the inside of the eyelids and then bends back over the front surface of the eye. The



conjunctiva makes oil and mucous which keep the eye moist and clean.

The **sclera** is the tough white outside coat of the eye.

The **choroid** is a layer of blood vessels and tissue that lies between the sclera and retina, providing nourishment for the outer layers of the retina.

The **extraocular muscles** surround the outside of the eye and allow the eye to move. Each eye has six extraocular muscles.

The **cornea** is a clear curved structure found at the front of the eye. As it is curved it bends light rays to help make the outside image coming into the eye smaller.

The **iris** is the coloured circular muscle at the front of the eye. The iris has a hole in the centre called the pupil.

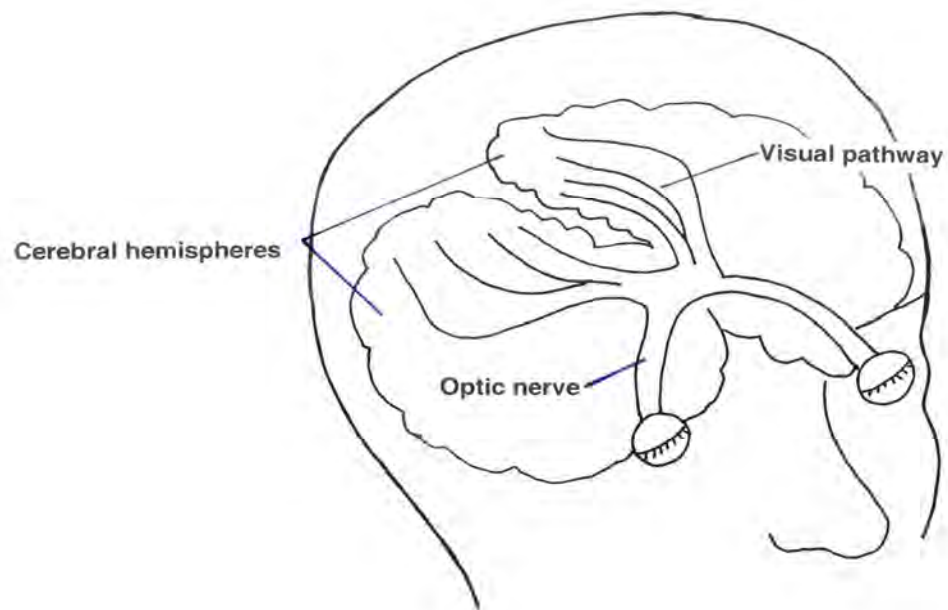
The **lens** is a clear curved structure that sits behind the iris. It is important for bending light rays to focus so the eye can see clearly up close.

The **ciliary body** has a muscle which sits around the lens to help it bend rays of light. It also produces the fluid which fills the front part of the eye.

The **retina** lies on the inside of the eye and receives images which get converted and passed down the optic nerve to the brain along the visual pathway.

Information from the eyes travels to the **visual cortex** in the cerebral hemispheres, where about 70% of the rest of the brain uses this information.

Normal seeing will only happen if the eyes, visual pathway and the brain are all working together.





3. What is Normal Visual Development?

The visual development period or the time when eyes and vision develop happens from birth to about 8 years of age in children. However most of this development happens within the first few years of life. By the time vision screening is done about half of the development of the eyes and vision has occurred.

Before Birth

The eyes are present very early into the gestation or early stages of development of the embryo. The eyes appear on the head of the embryo between 4-6 weeks of gestation. Anything that can affect the baby in these early stages like the mother having an illness, using drugs or alcohol can affect the baby's developing eyes.

After Birth

Babies are able to see when they are born. It is hard to say how much they can see **at birth** but we know that they like to look at faces and that they can watch and follow a moving picture of a face almost as soon as they are born. Babies bond with their mother soon after birth and can find their mother's face easily from a group of faces about 3 hours after birth.

It is believed that at birth babies don't have very good colour vision because the cells in their eyes that give colour aren't yet developed. Babies will be happy to watch black and white objects early on.

Often baby's eyes move in strange ways – this is normal for a few weeks.

The baby's eyes are smaller than an adult's eyes and will grow until they reach about 8 years of age.

By about **6 weeks** of age the baby is able to move their eyes into all directions and fascinated with human faces and will spend time looking at faces. Often around 6 weeks babies start to smile.

The baby may still go cross eyed but the strange eye movements should have stopped and the eyes should look straight most of the time.

The baby should have a blink reflex, i.e. they will shut their eyes when something comes close to their face.



The baby will start to see in colour around **8 weeks**.

By **12 weeks** the baby's eyes should be very coordinated and will be able to follow objects with their eyes and reach for things that interest them.

By **6 months** the baby is very curious about its environment and will use its vision easily to locate objects. The baby will be fascinated by its family and home.

By **12 months** the vision is very good. The baby can see small, detailed objects and can recognise familiar faces from a distance.

By **2 years** it is believed a child can see the same as an adult.



4. What happens when Normal Visual Development is disrupted?

When a baby is born with an eye or vision problems it will probably never develop normal vision in the affected eye/s even when the problems are found early and treated quickly.

If the eye or vision problem happens later it can still have a major affect on the development of vision. How much the problem affects the visual development will depend on how fast the child gets treatment and how well the treatment is carried out.

The most common way that normal visual development is affected is when a child needs glasses but doesn't have them or refuses to wear them. If glasses aren't worn the eyes see a blurry image. If only one eye is affected then the child's brain uses the good eye and ignores the blurry eye. This can mean the blurry eye can almost stop developing vision and suffer vision impairment. When both eyes have a blurry image the brain will pick the clearer eye and use that eye; the second eye will then be ignored and suffer vision impairment.

When a child needs glasses they should wear them all the time. This can help to treat the vision impairment they have.

Any eye or vision problems need to be found and treated as early as possible to give the child the best chance to see well in both of their eyes into adulthood. Vision screening is very useful for finding reduced vision so treatment can be started as quickly as possible.



5. Signs that a child might have an eye or vision problem

Children don't usually complain of eye and vision problems, even when they can't see well. Often the child's family notices something about the child's eyes or about how they use their eyes and vision which makes them think the child may have a problem. These are called signs. The child's family and vision screeners should watch for any of the following signs which might show that the child has eye or vision problems:

- The eyes don't look normal
- The child closes or covers one eye
- The child turns or tilts their head to one side
- The child rubs their eyes a lot
- The child gets very close to things to see them
- The child is uncomfortable or upset when they are having their vision tested, especially if it is only when one eye is tested & they are happy to have the other eye tested
- The child can't see things far away
- The child has frequent eye infections
- The child has watery eyes
- The child has sore eyes
- The child has red eyes

The following might be signs that a more serious eye or vision problem is present:

The child may:

- Not seem to look at things or make eye contact



- Not accurately reach for objects
- May not have coordinated eyes
- May have frequent horizontal or vertical jerky eye movements (nystagmus)
- May have sensitivity to bright light
- May have “blind behaviours” such as eye poking, rocking and head nodding
- May have slow speech
- May not be able to move about freely, especially in dim light
- May have poor posture such as leaning backwards when walking without holding their head up; seem to walk in a strange way; have floppy hands
- May not cope with different levels e.g. steps & kerbs
- May have difficulty with sleeping



6. The Rules of Vision Screening

- It is very important when you screen children's vision that you are careful to be accurate – you should aim to find all of the children who have reduced vision AND all of the children who have normal vision in both of their eyes.
- You must try to test the child in the best environment you can and make it fun for them so that you get accurate vision from both eyes.
- Remember you are testing children and they get tired and sometimes bored.
- Remember you have two eyes to test on each child so don't take too long on one eye.
- You should only have one child with you when screening – don't let other children see the vision test as they may remember the letters for when it's their turn to be screened.
- You must follow every step you will be taught for vision screening in every child – if you follow these steps you should become very good at vision screening and will be able to help the children you are screening.



7. Steps in Vision Screening

1. If you can, ask the child's family the questions in "8. Questions to ask the Child's Family before Vision Screening" p. 15
2. Set up the vision screening environment accurately
3. You and the child wash your hands with soap and dry them with a clean paper towel
4. Observe the child's eyes and record
5. Carry out vision screening on both eyes and record
6. Decide if the child has passed or failed vision screening
7. Prepare the referral if the child has failed

Tell the child's family if the child has passed or failed vision screening and what will happen now.



8. Questions to ask the Child's Family before Vision Screening

It can be very helpful to speak with the child's family before vision screening. Here are some questions that can be asked.

- Are the family worried about the child's eyes or vision and why? Is this different to what they have noticed with other children?
- Was the child born prematurely, i.e. born early?
- Has the child suffered any major trauma or illnesses in their life & if yes, what were these?
- Does the child have any health conditions or diseases at the moment?
- Are the family worried about any part of the child's development and why?
- Is there anyone in the family with any type of eye or vision problem? If yes, what is the eye or vision problem?

If the family has answered "yes" to any of these questions then the risk that the child may have an eye or vision problem is increased.



9. Setting up the Vision Screening Environment

It is very important that the location for vision screening is chosen and set up carefully. If it is too noisy or there is too much sun, or the testing distance you have set up is wrong you will not screen the child's vision properly.

Here are some helpful hints:

- Vision screening should be done inside, away from the direct sunlight. If you can't do vision screening inside then test in the shade.
- It is best to vision screen children in the morning as they may find it easier to concentrate before lunch
- Vision screen in a quiet place so the child doesn't get distracted

You will be able to test the child's vision accurately if you are testing at the correct distance. The vision screening kit you have been given has a measuring string – you must always make sure that the distance from the child's eyes and where you are holding the vision test is 6 metres. You can easily use the string to set up this distance and check during vision screening that the distance remains correct.

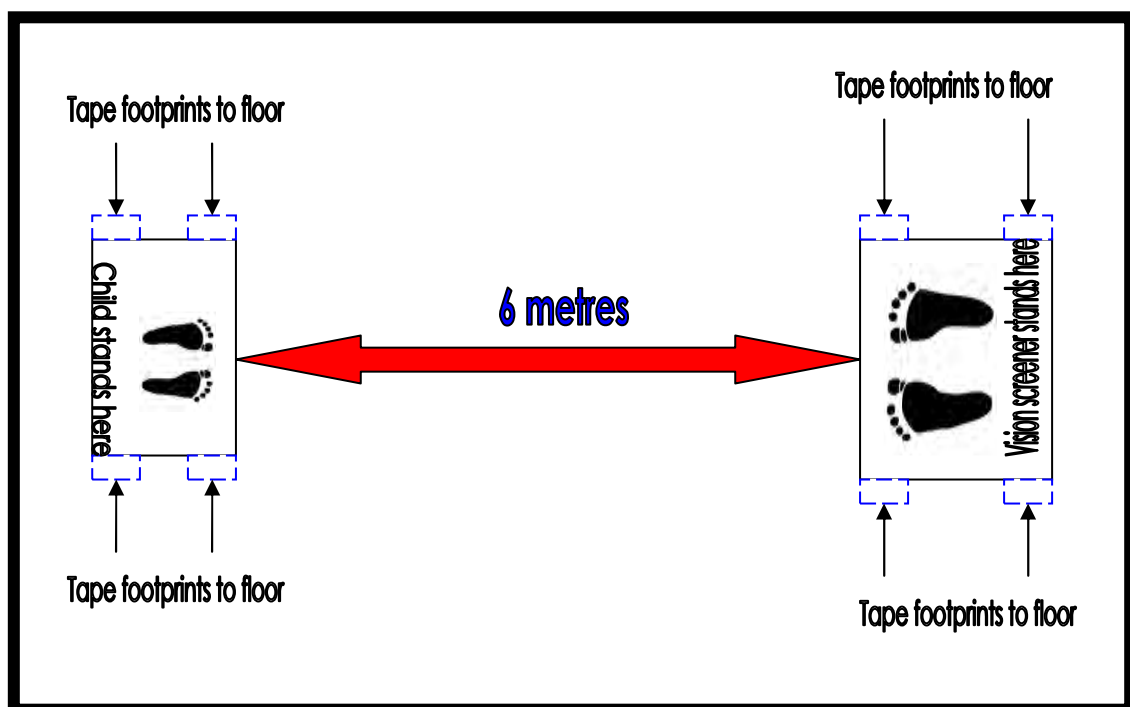
- If you test closer than 6 metres you will pass children who should fail vision screening
- If you test further away than 6 metres you will fail children who should pass vision screening
- When choosing the space for vision screening start by checking that you have a distance of 6 metres – if you don't then look for another space to use.

When you are sure that you have 6 metres, you are ready to set up the vision screening area. Make sure you follow the steps below:

- Tape the small foot prints to the floor – this is where the child will stand during vision screening



- Get someone to hold one end of the string by the loop. Ask them to hold the loop up to their eye level and keep it there until you have measured.
- Now you hold the loop on the other end of the string and walk away from them until the string is tight. Hold the string up to your eye – this will give you a distance of 6 metres from where the child stands to where you will hold the vision test.
- Make sure the string stays tight, stand on your footprints and move them until they are under your feet. You or someone else tape your footprints into this position.
- You have now measured out a testing distance of 6 metres between you and the child – this is the correct distance for vision screening. If you have taped the child's footprints and your footprints you should not have to measure the distance again – if the child's or your footprints come loose from the tape you will need to re-measure the distance to make sure it is 6 metres.
- If you don't have tape to secure the footprints then measure the distance each time before you start vision screening by you and the child holding the string up to your eyes, making sure the string is tight.





10. Germ Control while Vision Screening by Hand Washing

- Whenever you touch another person you can get germs from them which can harm you and then other people you touch. You won't be able to see these germs just by looking at the person. It is very important to protect yourself and your family, and the children you will vision screen.
- Before you vision screen a child you should always wash your hands with soap and clean water, and dry your hands with clean paper towel.
- Once you have vision screened a child you should wash your hands again before vision screening the next child. Keeping your hands clean will keep you, your family and the children safe from germs.
- Every child should wash their hands with soap and clean water and dry their hands with a new paper towel before having vision screening. This will mean whatever they touch should be free of germs for the next child.
- Don't let children share the paper towel and change the water before the next child, so the water they are washing their hands in is clean.
- Make sure that all used paper towel is placed in a garbage bin and that this bin is emptied each day – never reuse paper towel as it may have germs on it.
- If there is no paper towel to use make sure you and the children shake their hands until dry to get the water off.



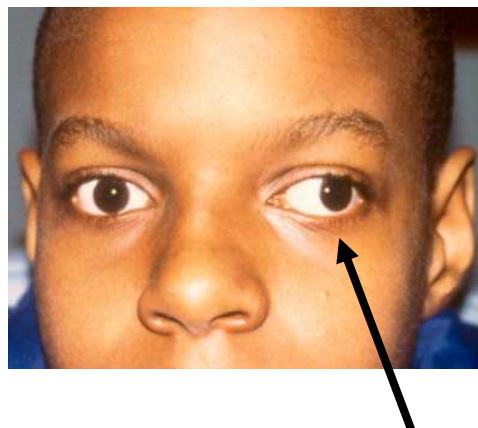
11. Observing the Child's Eyes

Before you start to test the child's vision you should take some time to look at their eyes. Look to see if there is anything wrong with their eyes. Below are warning signs that something might be wrong and the child should be sent to an eye doctor even if they pass vision screening:

One eyelid hangs down and covers the eye

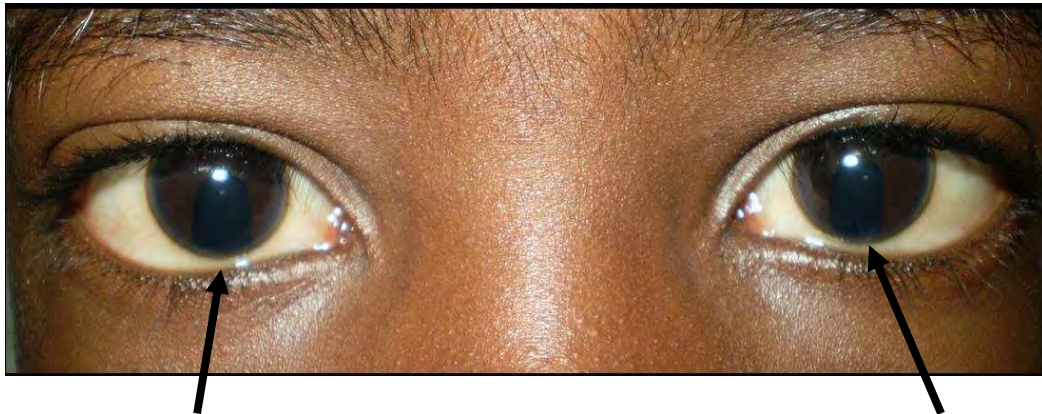


One eye is not straight – turned in or out

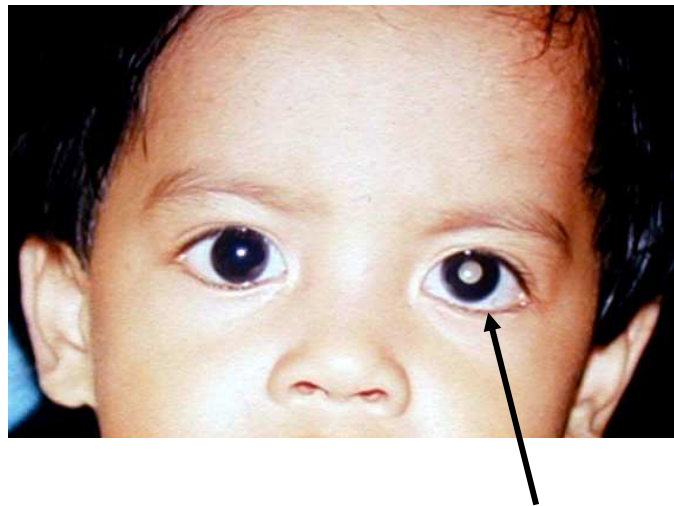




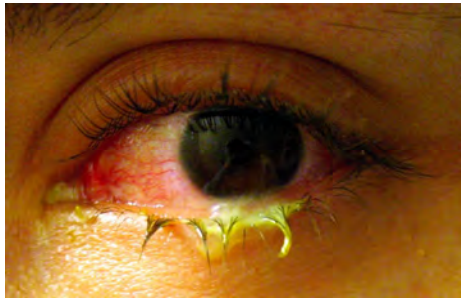
There is a defect of the eye



The pupil which is in the centre of the iris or coloured part of the eye is not complete



There is an eye infection.



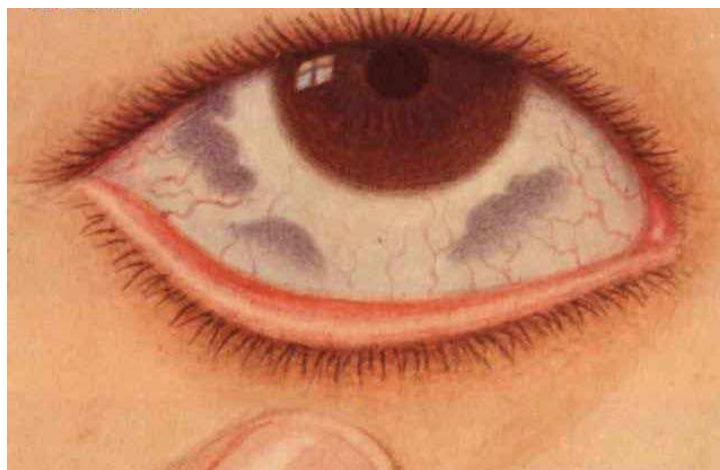
Do not do vision screening on a child with an eye infection until the eye infection has been treated as it may spread to you and other children.



It is common in people with dark skin that they may get blue, grey or brown spots on the white of their eye. This is usually due to extra pigment. Pigment gives the skin colour and this can occur on the white of the eye.

If you notice these spots you can ask the family if they have changed in shape or size – if they haven't then they are probably safe. If they get bigger then the child should be checked by an eye doctor.

Here are some examples of these spots which don't cause the child any harm:





12. How to do Vision Screening

(a). Explaining vision screening to the child

You will be doing vision screening with young children so it is important that they understand what you want them to do. When you are explaining vision screening to the child, here are some things that might help:

- Remember that you might be a stranger to the child – make sure you are friendly and happy
- Tell the child that you are going to play a game to check the vision in both of their eyes
- Tell the child that you aren't going to hurt them or touch their eyes
- Show the child the footprints on the ground and tell them that they must stand on the footprints and not move from there until you tell them
- Give the child the matching board & tell them that you are going to play a matching game
- Hold up the practice card and point to the letters on the card. Ask the child to match the letters with you on their matching board
- Point to all of the letters on the practice card. Point to each letter from the bottom, being careful not to block any letters with your hand.

A X T O U H V





- If the child gets any letters wrong you should go back and check the letter again once you have pointed to all letters on the practice card
- Make sure the child understands the matching game before you start vision screening



(b) Covering the child's eye

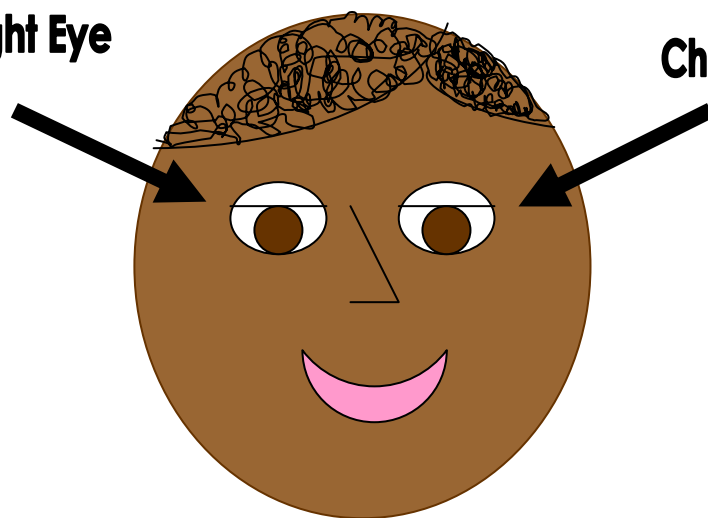
It is important that the child has one eye tested at a time, never test the child with both eyes uncovered – the child may have poor vision in one eye and good vision in the other – if you test with both eyes uncovered you won't know what the vision is like in each eye.

Covering an eye for vision screening can be tricky – children don't like to look with one eye only, especially if they can't see well. Be patient and kind, and encourage them to wear the patch. It can help if you tell them you are going to make them into a pirate to play a game.

Make sure the child keeps one eye covered at all times during vision screening. Tell them to keep their head straight and don't let them lift up the patch during vision screening.

When you cover an eye for vision screening, remember as you look at the child's face, the child's right eye is on your left hand side, and the child's left eye is on your right hand side.

Child's Right Eye



Child's Left Eye

Make sure you swap the patch to the right eye before you start testing the vision in the left eye. You can use the same tissue under the eye patch.

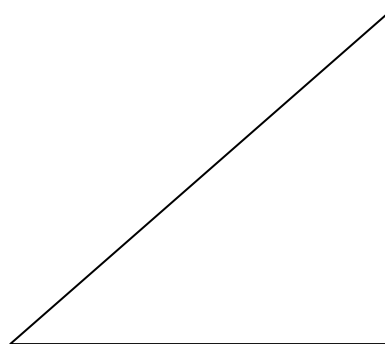
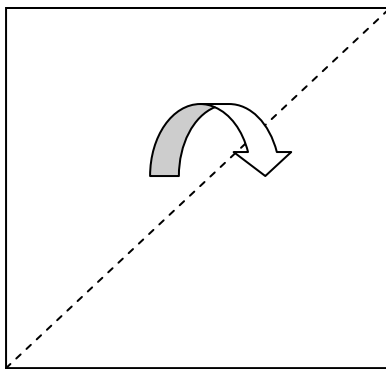
Once you have done vision screening on both eyes you should throw the tissue in the garbage bin – don't use the tissue on more than one child as you will spread germs.



(c) Testing the child's right eye

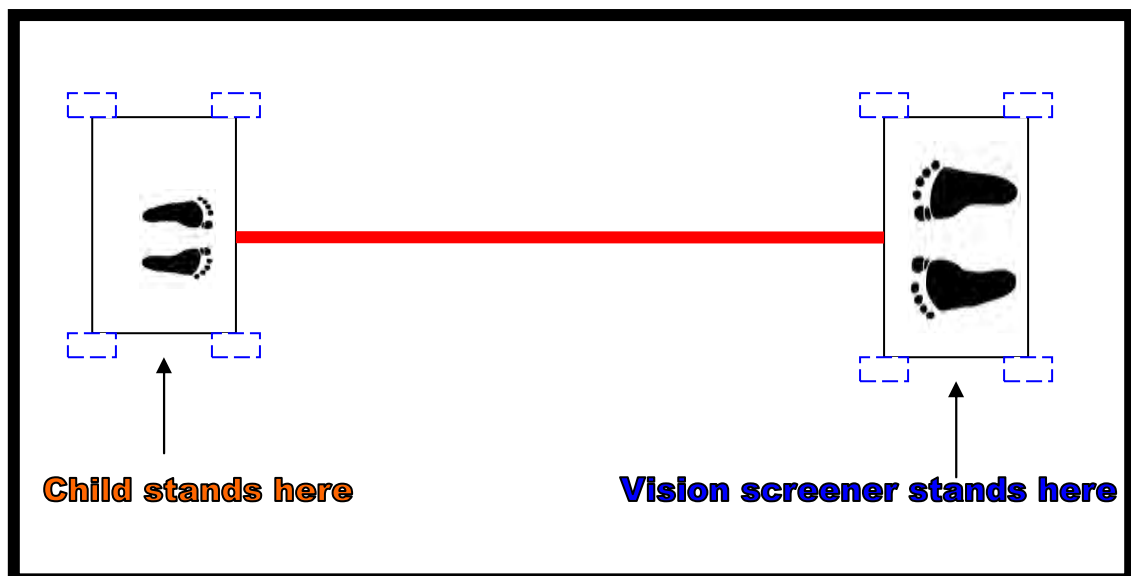
Always test the right eye first so you have a routine in your vision screening.

- Fold a soft tissue to make a triangle and place this under the black eye patch.
- Tell the child to close their eyes and put the eye patch and tissue over the child's left eye. Stretch the elastic around the back of the child's head. The child will now only be seeing out of their right eye.





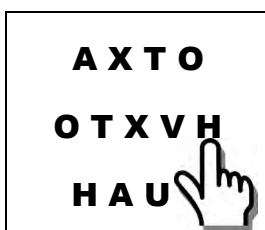
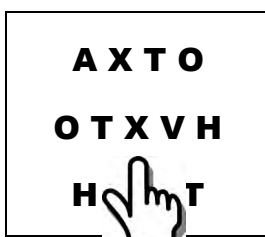
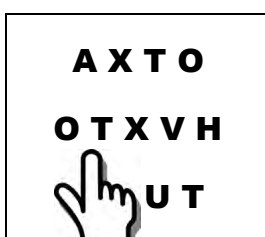
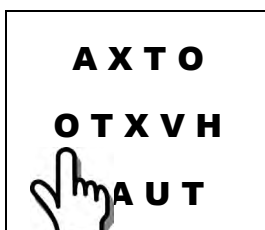
- Choose one of the vision screening cards – don't show this to the child as they may see the letters before you get to 6 metres
- Move to stand on your footprints and show the child the vision screening card you are holding.



- The vision screening card has 3 rows of letters. You will only be pointing to the **middle row** – you don't need to point to the top or bottom rows.



- Point to each letter on the **middle row** of the vision screening card. Start at the first letter and point to the letter from the bottom. Ask the child to match this letter on their matching board.





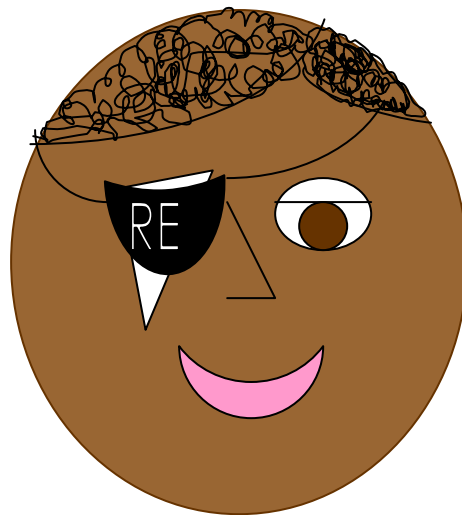
- Make sure that you point at the letter and not between 2 letters
- Make sure that you point to all of the letters on the line
- Don't isolate letter between two of your fingers
- If the child gets any letters wrong you should go back and check the letter again once you have pointed to all letters on the vision screening card
- Record how many letters the child matched correctly for their right eye, e.g. 5/5 on the child's vision screening card
- Once you have recorded the vision for the right eye you are ready to test the child's left eye



(d) Testing the child's left eye

Tell the child that you are going to test their other eye.

- Tell the child to close their eyes. Swap the tissue and eye patch to cover the child's right eye.
- Stretch the elastic around the back of the child's head. The child will now only be seeing out of their left eye.





- Choose a different vision screening card – don't show this to the child as they may see the letters before you get to 6 metres
- Move to stand on your footprints and show the child the vision screening card you are holding
- Repeat all the steps you followed for the right eye
- Record the vision for the left eye

It is very important that you throw away the tissue one you have tested the child – never use the tissue again for another child as you may spread germs.



(d) Recording the child's vision

Record how many letters the child matched correctly on the vision screening card. Don't swap the eye patch to the other eye until you have recorded the vision of the right eye.

You should record a number out of 5 which indicates how many letters the child matched correctly on the middle line.

The child matched 5 letters	Record 5/5
The child matched 4 letters	Record 4/5
The child matched 3 letters	Record 3/5
The child matched 2 letters	Record 2/5
The child matched 1 letter	Record 1/5
The child matched 0 letters	Record 0/5

Remember to record the vision for the right eye as soon as you have tested it, before you screen the left eye.

Remember to always record the vision for both the right and left eye.



(e) Did the child pass vision screening?

A child will have passed vision screening if they matched 5/5 or 4/5 for both the right eye and left eye. If they match 3 or less for one or both eyes they have failed vision screening. Below are a few examples:

Result		Pass or Fail?
Right eye	Left eye	
5/5	5/5	Pass
5/5	4/5	Pass
4/5	5/5	Pass
3/5	3/5	Fail
4/5	3/5	Fail
5/5	2/5	Fail
0/5	5/5	Fail
3/5	1/5	Fail

If a child gets 4/5 or 5/5 for both eyes on vision screening but you have noticed an abnormality of their eye/s, or their family is very worried about them, you can still refer them to a local eye doctor to be checked.



13. Things to remember when screening the child's vision

Before you start screening the child's vision:

- Make sure you have measured out 6 metres between you and the child properly
- Make sure the child is standing on the footprints
- Make sure you are standing on your footprints
- Make sure the child understands the matching game

While you are screening the child's vision:

- Watch to see if the child is getting tired or upset – make sure you give them a rest.
- When a child can't see they may get upset – if this happens tell them it is ok and that it is good they tried for you.
- Always ask the child to keep their head straight – if they move their head around it might be because they can't see properly – make sure they can't peek from the covered eye



14. The Vision Screening Card

Child's name		
Child's date of birth		
Child's mothers name		
Child's fathers name		
Child's address		
Location of vision screening		
Name of vision screener		
Date of vision screening		
Observation		
Answers to family questions Family are worried Child born premature Illnesses or trauma Someone else in the family with eye or vision problems	Yes	No
Results		
Vision for the right eye	/ 5	
Vision for the left eye	/5	
Signature of screener		



15. Hand Washing

Washing your hands is the best way to stop infections – this means you getting an infection and you passing on an infection on your hands.

When you do vision screening it is important that you wash your hands before you start to vision screen a child. It is also important that they wash their hands too, so any germs on their hands don't pass onto the testing equipment. If this happens then the next child to be vision screened may get the germs.

Here is a safe way to wash your hands.

- You and the child must always use soap and fresh water – don't wash your hands in dirty water.
- It doesn't matter what type of soap you use – the most important part about washing your hands is that you rub your hands while you do it – this is the best way to kill the germs.
- Wet your hands and rub the soap over the top of your hands, on the palms of your hands until you get a lather of soap or bubbles. Rub between your fingers and around your finger nails.
- Rinse the soap off your hands with clean water.
- It is best if you can use running water from a tap



- If you can't then use a large bowl and a small bowl. Make sure the small bowl is big enough to fit your hands into it.





- Each time you wash your hands fill the small bowl with water from the large bowl.
- Wash your hands with soap in the small bowl, and when you are finished, tip out the water from the small bowl. Refill the small bowl each time you wash your hands
- Dry your hands on a clean paper towel or by air drying them – it will help if you shake your hands

To help the child wash their hands, if you don't have a tap with running water you can fill a clean plastic container with clean water, pour water over the child's hands then give them the soap.



The child will find it fun if you ask them to sing a song while they wash their hands. Tell the child to keep singing until they have finished washing.

Tell the child to:

- Rub the soap over the top of their hands, on the palms of their hands until they get a lather of soap or bubbles
- Rub between your fingers and around your finger nails
- Then using the plastic container with water, rinse the soap off the child's hands
- Ask the child to dry their hands on a clean paper towel or by air drying them – it will help if they shake their hands to get the water off



Remember:

No one should wash their hands in dirty water

Everyone should use clean water and soap to wash their hands

Everyone should rub their hands while washing to get rid of the germs

If you don't have any soap you can use then you can sprinkle your hands with salt and wash your hands as already described. You can use salt with the child as well.



16. Healthy Eyes

Eating **healthy foods** will help to keep eyes working well. Food that is good for the eyes includes:

Fish

Milk

Fruit – apples, pears and oranges

Vegetables – carrots, broccoli

The **sun** can damage the eyes – children should be reminded never to look straight at the sun. Wearing a hat with a wide brim will cut down on the sun's rays entering the eyes.

Face washing can help keep the eyes clean – children should wash their faces every morning and night. Keeping hands clean also helps to stop germs reaching the eyes.

Children can easily **hurt** their eyes by things like sticks and rocks. They should never be allowed to play with things that are dangerous to their eyes. Adult supervision is very important and can help prevent children from hurting their eyes.

If a child hurts their eyes they should tell an adult straight away – sometimes they won't do this in case they get into trouble. The faster an injured eye gets help, the better the healing will be.

These workers are checking the child understands the concept of matching before starting vision screening.



Here the worker has taped the footprints to the floor to make sure they don't move around during vision screening, which could make vision screening inaccurate.



This photo shows the workers setting up the vision screening environment. They are carefully measuring the distance between the footprints. Here they are using a measuring tape. A six metre string can also be used.



These photos show workers pointing to letters on the Vision Screening Cards.



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