

Education

Vision and learning

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Children who have Down's syndrome tend to be very good visual learners due to their strong visual memory. However, all children who have Down's syndrome have poor visual acuity and many will also have an additional visual impairment. These will not always be picked up in children who have Down's syndrome as it is sometimes wrongly assumed that any difficulties in learning or behaviour are due to their condition.

Therefore, it is vital for children who have Down's syndrome to have regular eye checks (at least every two years for school aged children, or more frequently if recommended by an optometrist or ophthalmologist). A lot of children will have long-sight, short-sight and astigmatism. Typically developing children are often long or short-sighted in early infancy but grow out of these errors over the first few years of life. Children who have Down's syndrome start out with a similar range of errors but are much less likely to outgrow the errors and much more likely to become more long or short-sighted.

What to look out for

The following may be indicators that a child has vision problems:

- poor concentration
- being easily distracted
- clumsiness
- avoidance of near tasks
- not completing work
- physical signs such as frequent blinking, screwing up their eyes or irritated eyes
- frustration with school and getting easily upset.

Accommodation (focusing at near)

The greatest differences between vision in children who have Down's syndrome and typical children are found in their close or near vision. It is this vision that is needed so much in school or when children are following their interests, such as reading or looking at a book or playing on the computer.

Children who have Down's syndrome focus very poorly at near vision and tend to under-accommodate by quite a large amount. This is consistent for any individual child and persists even when the children wear their glasses to correct long sight. This means that near work, especially in school, must be more difficult for the children because it is out of focus. Research by Maggie Woodhouse at Cardiff University has suggested that children who have this problem with focusing benefit from wearing bifocals, at least in school. Some children who have Down's syndrome choose to wear their bifocals all of the time, preferring them to the conventional "single vision" glasses. The research also identified a surprising finding: it wasn't the case that the children in the study couldn't focus properly; it was that they didn't focus properly. Some of the children in the study began to focus accurately over the top of their bifocals. After two or so years of wear, these children were able to revert back to using ordinary lenses. The bifocals taught them to focus on their own.

Correctly fitting glasses

A child who has Down's syndrome is ten times more likely to need to wear glasses than a child who doesn't have the condition. In 2011, following concerns from some of its members about poorly fitting glasses, the Down's Syndrome Association carried out a survey of both children and adults to see how big the problem was. A massive 45 per cent of respondents did not think their glasses were comfortable. Most comments were made about improvements to overall fit. Children who have Down's syndrome have smaller noses and a shorter distance from ears to face than typical children and so glasses have a tendency to slip down. This is not only irritating for the child but means that he or she isn't looking through the correct part of the lens. It is therefore important they have glasses that fit properly and comfortably without slipping.

There is an exciting new research study being carried out at Aston University, Birmingham using facial analysis to build a profile of the facial measurements of children who have Down's syndrome. This information will be used to find out what spectacle frame parameters need to be produced in order to comfortably fit children who have Down's syndrome. It is hoped that this profile will inform spectacle frame manufacturers with useful data in order to provide specific frames.

Visual acuity

Many children who have Down's syndrome will need to wear glasses, but even when correctly fitted glasses are worn, 100 per cent of children who have Down's syndrome have poorer visual acuity than other people. These children see the world differently; their world lacks fine details and sharp contrasts. Thus, reading materials, for example, do not look the same to a child who has Down's syndrome as they do to his/her classmates. To take advantage of their strength as visual learners and to help them succeed, we need to make sure they can see things. Providing them with big and bold printed materials will help to compensate for their poorer visual acuity. It is very important to take their poorer visual acuity into account in all settings where children are learning.

Top tips

In addition to providing big and bold printed materials, here are some tips you can use to help pupils who have Down's syndrome:

- place the child near the front of class
- make sure teaching/learning materials are clearly presented in black felt pen
- give the child a black pen to help them see what they write clearly

- check they can see the words in their reading books (the size of print in books tends to get smaller as reading skills develop)
- avoid faint lines in exercise books, badly photocopied sheets and yellow highlighter as they may not be seen
- ensure all materials in school have high contrast and visibility, for example, you may find the pupil responds better to seeing print written in black felt tip as opposed to pencil or on yellow rather than white paper
- where there is text in learning materials it should be no smaller than 18 point
- use simple and clear presentation with less detail rather than more
- when asking the child to write, highlight lines on the page with a bold colour to improve the child's ability to focus on them
- ensure the child's glasses fit properly and are worn
- seek advice from the Visual Impairment Service within your local authority

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