

Math and Vision, What's the Connection?

By Dr. Christina Danley

The way children tell us they have a vision problem is with their behavior, academic and sports performance. A 'clumsy' child may have poor vision in one eye which makes depth perception nearly impossible (lazy eye). A child who hates school, has difficulty paying attention or struggles with reading can also have a vision problem. And, believe it or not, difficulty with math can also be a sign!

From an early age, children are taught how to count by showing them objects and counting as we point to them. They learn simple addition and subtraction by showing them objects as well. As children get older, pictures are replaced with abstract symbols such as numbers. The numbers become larger but the print size becomes smaller. Math problems require reading word problems and lining up decimals and columns of numbers.

In fact, 80% of how a child learns is through their vision. If their visual skills are not what they should be, they will have difficulty learning. It's that simple.

Children assume their vision is normal and never complain, especially when they are younger. The only way a parent is able to determine if there may be a problem is by knowing the symptoms to watch for.

So let's talk about the symptoms to watch for when it comes to math. Difficulty lining up numbers and decimal points, and reversing numbers can definitely be a sign of a vision problem. Children who do great at simple arithmetic yet fall apart when they see a word problem usually have vision problems at the root of their difficulties as well. Addi-

tionally, a school-aged child who has to count small numbers of objects (i.e. dots on dice) may have a vision problem.

At this point I am sure you are wondering how a vision problem can cause this much trouble. In order to answer this question, we need to talk about what



vision really is. Most people think that if they can see the letters on the eye chart and are told they have 20/20 vision or better, then their vision is fine. What they don't realize is that all this tells us is that they can see things clearly that are 20 feet away! It doesn't tell us anything about your child's ability to see up close nor does it tell us how long a child can see clearly, especially when doing a task such as homework.

Vision is a complex process that involves over 15 visual skills which are critical to academic success. Seeing 20/20 is just one of those skills.

Another assumption that parents often make is that when they go to see any doctor that the doctor will automatically know what to look for without any input about what symptoms the child has or what the child is struggling with. When you go for an eye exam, you need to tell your optometrist what problems the child is having so he or she will know what to look for.

In order to find out if a vision problem is interfering with your child's ability to perform in mathematics or succeed in reading and learning, you need to see a developmental optometrist. That is an eye doctor who has special training in how vision develops and in treating developmental vision problems. Children with developmental vision problems may or may not have other developmental delays. A child who skipped crawling or was born prematurely should definitely have a developmental vision evaluation.

There are ways you can help your child build the visual skills necessary for learning math at home. First, make sure that your child is able to count objects and identify quantities visually before introducing numbers. Then, when introducing new concepts such as addition,

subtraction and multiplication, ensure that your child understands the concept using visual cues before using numbers only.

GeoBoards are a great way to help children develop the ability to visualize math concepts. Tanagrams and parquetry blocks will allow your child to build the visualization skills necessary for geometry.

For more information on developmental optometry and to find a developmental optometrist near you please visit the College of Optometrists in Vision Development at www.covd.org.

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