

Supporting Students with LDs in a Comprehensive Math Program

>> All students have the capabilities to learn and achieve success in math, including students with learning disabilities, or LDs.

The York Region District School Board has a comprehensive math program to engage all learners through deep learning innovative teaching and sound assessment.

>> We promote a comprehensive math program in our board. In a comprehensive math program, there's three different components that we look at; we look at the environment, we look at the learner and we look at the learning experiences. Thinking in terms of our students with a learning disability, that's just more information to add on. So we get an insight into, what are their areas of strength? How can we use those areas of strength to help support those areas of need and make sure that they can be successful and have access into the learning?

>> Creating a positive environment that allows students to feel safe, to make mistakes and accommodates their learning styles is important in mathematical learning, especially for students with LDs.

>> First I really want to be creating an environment where students feel safe, where they feel that they're included in part of the learning, where there is equitable opportunities to engage in those learning tasks. That may look when we think about the physical spaces. Desks or tables are created in such a way that engage in collaboration, giving students opportunities to talk and share through their learning, as they're developing their understanding.

>> Part of it is the getting to know your learner, and what do they need? So is there times where they need a desk all by themselves, because they need that time to focus? Is there certain spots that, if I know of a student that's distracted very easily, maybe having that desk or having that group right next to the window isn't the best.

In addition, with thinking in terms of math, we know manipulatives are extremely important. So it's also having that in the room so the students can have access to them at any point. So it's not just, here's the manipulative for this day of learning. Sometimes I might direct them to a specific one, but it's also having that shelf and making it the norm that our students can go and get whatever they need at any point.

>> It's important for educators to be familiar with each student's learning profile. Understanding individual strength and needs will assist in determining appropriate accommodations and differentiating instruction to help students access the curriculum and



demonstrate their learning. For students with LDs, individualized accommodations must be reflected in their IEP.

>> Another way that we support students with learning disabilities in mathematics is, we really look at what's in their individual education plan? So we want all of our learners to have individual education plans that are personalized. So we want the things that are listed in those plans to really -- you know, if I need support with visual motor integration, or with memory, I want my accommodations to be really targeted. Then I want them to have some that are specific just about math and math learning. When I'm doing that, I want to then make sure implementation happens. So we support teachers with implementation of the individual education plan.

>> There's no fulsome list of accommodations that will work for everyone. An accommodation that works for one student with a learning disability in mathematics might not work for another student, who also might have a learning disability and have some challenges in mathematics. What an accommodation looks like for one student may look very different than the accommodation for another student.

>> It's important to know your learner to find the most suitable technologies to support their mathematical learning. There are many technological tools and web-based programs that can be accessed at school, as well as at home.

>> So if we're trying to support fine motor skills, we're looking at technology that would support perhaps speech to text. If we're looking at supporting language, we may be looking at text to speech, or word prediction. Students with visual spatial or visual motor skill needs may require visual or digital manipulatives. For areas of memory, processing speed or attention, we might also be looking at the ways we can use technology to chunk the work and make it more flexible for them.

One of the tools that we've been looking at is called "EquatIO." It's produced by a company called "Texthelp." It is a web-based program that students access through Google Chrome, and it supports students through handwriting, prediction, speech to text, as well as providing a math space where teachers can work with students in a collaborative manner on math. It also allows them to take that math home and review it.

So an example of a tool that we might use is "Mathies." So Mathies was created by the Ontario Ministry of Education, and it provides digital manipulatives that students can use for a variety of parts of the curriculum.



>> When planning accommodations for students, remember that they may require their accommodations during assessments and evaluations as well. For students with LDs, instructional accommodations must also be provided for in class and provincial assessments, and documented in the IEP.

>> When we think of accommodations, we often think about them through the lens of instructional accommodations, environmental accommodations and assessment accommodations. And while it's important to think about all three, we have to remember they're not in isolation of one another. An instructional accommodation, like, for example, a student who has visual spatial perceptual skills, a challenge in that area who uses manipulatives might also need to use manipulatives during an assessment in order to support building that conceptual understanding. So that accommodation would be equally as important as an assessment accommodation.

>> When it comes to assessment, we need to make sure that we are honouring our students' IEPs. We need to make sure we are offering different modalities of responses, because students are able to demonstrate their understanding, but frequently they need different opportunities or different methods to explain their knowledge.

>> Beyond the instructional and assessment considerations, it's important to remember that students with LDs may have social and emotional concerns that affect math learning.

>> So we recognize that when it comes to mathematics, anxiety is definitely real. There are some people who come with mind-sets that, you know what, I was not born with the math gene, so it's okay. Don't worry about that. And we actually want to break that. We want to break those barriers to say, actually, everybody is born with a math brain. Students recognize that mistakes are valuable, and mistakes are actually stepping points for new learning, or new opportunities. So as opposed to having that perfectionism or anxiety of knowing how am I going to get the right answer? It's really about the process of learning and creating that environment in space.

>> Thinking about how students view themselves in math class, we want every student to see themselves as a mathematician, that they're capable of solving problems and looking for patterns, and just asking questions about it.

>> Educators can improve the learning experience for students with LDs through design and delivery of mathematical content that will allow students to develop key skills, such as problem-solving.



>> Really understanding, what does a math task look like? So how is it that we are understanding students' strengths, understanding their needs, but creating a place that the task is challenging where their thinking is at, but we're getting under through some of our questions and prompts to actually challenge and push them to the next level.

Something that we know about math is, it's very developmental. So the strategies they're using, the math models that they're using, and the math content is going to be developed over time. So how is it that we're supporting educators and supporting students, and recognizing that with one task, there may be several skills that they're developing, so that they'll become confident problem-solvers.

>> The York Region District School Board has seen success with their comprehensive math program through collaborative work amongst educators, and drawing on data to support their decision-making.

>> We work collaboratively across disciplines and across departments. Our work is intertwined with the work of the curriculum and instructional services team. So we will have special education consultants working hand-in-hand with math consultants in the creation of resources that are designed to support students with learning disabilities in math.

>> So we had teachers from the regular classroom. We had teachers from the student support centre. We had teachers from the math curriculum. We had psychologists. And we all came together to try to understand more deeply what was happening for students who were struggling in math.

>> The resources and supports that we provide educators in schools and families, it's a very strategic approach. So we use rich, varied data sets to tell us what the need is, and then we very strategically pinpoint that need in the development and the provision of resources and support.

>> The work they have undertaken as a team has led to positive outcomes for students and educators alike.

>> If we all have a common understanding and a common language, and we understand what learning disabilities are, we know what they look like in the classroom, we understand the processing areas and how they impact on learning, and we have a common understanding of strategies that can be effective that are evidence-based and research-informed that can



support our students, then we know that we're going to be able to reduce stigma. We're going to be able to help students to pursue potential, because they are going to be understood.

>> And also, I think really build the idea and understanding that, you know what, targeted intervention in math works. And that if we have specific, intentional strategies in mathematics, we're going to see results for our students with learning disabilities. And that's empowering for teachers.

>> We need creativity. We need critical thinking. In mathematics, those are skills that are built every day within the classroom.

>> Math is part of our everyday lives. And it's important that all students have the support and skills to be confident and successful. With innovative technologies, individualized accommodations, an understanding of what learning disabilities are and what supports are available inside and outside the classroom, any student can learn and do math.

For more information on how to support your students with learning disabilities in math, visit LDatSchool.ca.

