

Webinar Transcript: Math and LDs – Using Assistive Technology and Project-Based Learning to Support All Students

Presented by: Richard Parker, OCT, Halton District School Board

[SLIDE – FREE WEBINAR: Supporting Students with Learning Disabilities in the Differentiated Literacy Classroom]

[Text on slide: FREE WEBINAR May 7th, 2019 3:45 – 4:45PM ET.]

For technical assistance, please call 416-929-4311 ext. 27 or type your question into the question box in the GoToWebinar panel.

Image of a head with speech bubble containing three dots. Inside the head where brain would be are math symbols, a set square, and a calculator. Image of LD@school logo. Image of Twitter logo @LDatSchool #LDwebinar.]

[Cindy Perras]: The LD at School team is very pleased to welcome our guest speaker, Richard Parker, whose presentation this afternoon is entitled "Using Assistive Technology and Project-Based Learning to Support All Students."

[SLIDE – Funding for the production of this webinar was provided by the Ministry of Education]

[Image of LD@school logo]

Text on slide: Please note that the views expressed in this webinar are the views of the presenters and do not necessarily reflect those of the Ministry of Education or the Learning Disabilities Association of Ontario.]

[Cindy]: The Ministry of Education has provided funding for the production of this webinar. Please note that the views expressed in this webinar are the views of the presenter, and do not necessarily reflect those of the Ministry of Education, nor the Learning Disabilities Association of Ontario.

[SLIDE - Don't forget to use our social media hashtag!]

[Image of Twitter bird holding megaphone and speech bubbles coming out of megaphone]

Text on slide: #LDwebinar @LDatSchool]

[Cindy]: We will also be tweeting throughout the webinar, so if you would like to participate, you can send us a tweet by using our handle, at LD@School, or the hashtag LDwebinar.

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[SLIDE – WELCOME]

[Image of Richard Parker]

Text on slide: Richard Parker, OCT, Halton District School Board]

[Cindy]: That takes care of housekeeping for this afternoon, so let's get started. It is now my pleasure to introduce our speaker, Richard Parker. Richard is a teacher from the Halton District School Board, and he is a strong advocate for students with exceptionalities. He is also a certified Google educator who has worked with students with exceptionalities throughout his career, first as a teacher in self-contained settings, and then as an assistive technology lead within his school board. This led Richard to his current role at Trillium Demonstration School, where he works with students with learning disabilities and severe reading impairments. Welcome, Richard. The cyber floor is now yours.

[SLIDE – Math and LDs: Using Assistive Technology and Project-Based Learning to Support All Students]

[Text on slide: Twitter user? #LDWebinar]

[Richard Parker]: Hi everybody. Welcome to this webinar on Math and LDs: Using Assistive Technology and Project-Based Learning to Support All Students.

[SLIDE – Richard Parker @teacherparker]

[Text on slide:

- 15th year of teaching, primarily with Halton
- Former self-contained behaviour classroom teacher
- Special Education Resource Teacher
- Recently seconded by Ontario to teach at Trillium Demonstration School (currently on Parental Leave)
- Presented for HDSB, ETFO, ASET and OTF numerous times around technology]

[Richard]: They already covered this about me, so I'm not going to worry too much about that. I do have a lot of experience in special education, most recently at Trillium Demonstration School, so I've had a good chance to practice with a lot of these tools I'm gonna share today.

[SLIDE – About this Webinar]

[Text on slide: The premise from this webinar came from a small presentation I did at ASET last year, and then turned into an all day workshop for Trillium. I have adapted it to best fit the needs of a webinar. Resources on the Padlet link provided at the end are from the full day workshop.]



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[Richard]: The premise from this webinar came from a small presentation I did at ASET last year. I ended up turning it into an all day workshop for Trillium in the fall, and then I hope I have adapted it to best fit the needs of a webinar. Resources on the Padlet link provided at the end of this slide deck are from the full-day workshop, so there's more than I cover here. You could always reach out on my Twitter feed @teacherparker with a private message, and ask me any questions through there, and I'll get back to you when I see that, cause there are a lot of references.

[SLIDE – The myth of normalcy is the problem]

[Text on slide: "The myth of normalcy is the problem." – Jonathan Mooney. Link to Jonathan Mooney TEDx presentation (<https://www.youtube.com/watch?v=yJiNhWOG5hw>)

Image of two book covers *The Short Bus: A Journey Beyond Normal* by Jonathan Mooney and *Learning Outside the Lines* by Jonathan Mooney and David Cole]

[Richard]: So to start, Jonathan Mooney, he is a gentleman from the United States. He has a severe learning disability, and he has made it through Ivy League colleges, and he has written three books now. The other one just got released this year, and he has a phrase, "The myth of normalcy is the problem." In a lot of classes, especially math class, we teach certain strategies and certain ways to all students. One strategy to solve multiplication, one way to break down a fraction and make equivalent fractions, but that doesn't work for all students. Not all students are going to be able to solve the way that you teach, if you're only teaching the one strategy, or giving them one option of answering the question, so we have to branch out. We have to meet the needs of all students in our classrooms, especially students with learning disabilities or multiple exceptionalities, and we want to make sure that we are giving them opportunity to show their knowledge, explain their thinking in a multitude of ways so we aren't keeping them boxed in.

[SLIDE – Disclaimer #1]

[Image of a person casting a fishing line into the ocean with a rocky coast visible in the background]

[Richard]: So disclaimer number one, I am gonna throw a lot of things at you, and it's called casting lines, and if you are able to take one or two of those things away, that is great. If you're able to take more, that's fantastic, but pick one that's gonna work for you, try it, and then go back and pick another one later on. You will have access to this slide deck, so you will have access to look through this again.

[SLIDE – Disclaimer #2]

[Text on slide: The following websites are American, so will have content or language that differs from Canada:

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- Certain aspects of Google
- Equatio
- Vocaroo
- National Library of Virtual Manipulatives
- Screencastify
- Math Learning Centre]

[Richard]: Disclaimer number two, the following websites are American, so they'll have content or language that differs from Canadian websites, so certain aspects of Google will have that. Equatio, Vocaroo, the National Library of Virtual Manipulatives, Screencastify, and Math Learning Centre.

[SLIDE – From the mouth of students with Learning Disabilities]

[Text on slide: What makes math hard for you?

- Too many questions
- Word problems
- Formulas
- Multiplication and Division
- Geometry]

[Richard]: So from the mouth of students with learning disabilities, before I did my presentation for ASET, I asked them personal questions about math, and this is the feedback. They said when I asked what makes math hard for you, too many questions. So they're overwhelmed with the amount of questions given to them. Some students did explain that maybe giving them the similar amount of questions is okay, but breaking it up, here's a page with three questions, here's another page with three questions, instead of giving them all six or 10 at once. It can be overwhelming. The word problems, too wordy. Students who have learning disabilities and who struggle reading, or who struggle breaking down what the question is asking, or what it is giving them. The word problems are a challenge for them. They can be too wordy, too long, or just in general the word problems are hard. Formulas, remembering the formulas, so the student has memory retrieval issues, concerns. It is a challenge for them if they don't have access to the formula. You give them the formula, they can plug the numbers in and know how to use it, and that works great, but trying to remember all those formulas, especially as they go on to the higher grades and they've got more and more formulas, it does become challenging. Multiplication and division, sometimes separate or sometimes seeing the relationship between the two is challenging. And a lot of students said geometry is challenging, and that's one thing, sometimes we think geometry is easier because it's shapes and moving around a map, and for students with some spatial concerns, it is more challenging for them.

[SLIDE – From the mouth of students with Learning Disabilities]

[Text on slide: What can we do to help you?



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- Provide more one-on-one help
- More hands on
- Less words
 - o For us to write
 - o For us to read
- Move at a slower pace
 - o Less questions helps this
- Ask us about our learning style
- Formula sheets]

[Richard]: So my follow-up to that was, well what can we as teachers do to help you? So they said provide more one-to-one help, more hands on activities, so giving them more manipulatives, more challenges that are gonna ask them to work and find their answers through some hands on building, maybe. Less words, so less words for them to read, and less words for them to write in their communication answer. We're gonna really look at that today. And moving at a slower pace, so not expecting them to be able to grasp the concept within one or two lessons. Giving them a bit more time, and sometimes less questions does help that. Sometimes showing them videos over and over again, giving them access to videos helps. Asking them about their learning style is huge, especially once we get older and it's rotary math and you might not see that student every period, you might only see them for math one period a day, five days a week, and you don't get a chance to maybe learn their learning style, and giving them the formula sheets.

[SLIDE - Why use recording tools?]

[Image of a microphone icon]

Text on slide:

- Negates typing/handwriting
- Allows “conferencing” when you can’t conference
- Allows students who process faster get all of their ideas out
- Allows students who process slower to get all their ideas out... at their pace
- Usually improves clarity of answers]

[Richard]: So we're gonna talk about recording tools first. So why would we use recording tools? Well, for students with learning disabilities who have trouble getting their answers written on a page, it negates the typing or the handwriting they have to do. It allows conferencing when you can't conference. If you're working with a small group, and you want your students to record their answers, you may have a set of questions for them, and they can record their answers verbally, and you can, at a later time, go back and listen to it. So it's a great way to do that, a great way to conference without conferencing. Students who process faster get all their ideas out, so those students who need to get all out, might speak really fast. They get it out really quickly, which is great, before they forget it. And then students who process things slower get all their ideas out as well, but at their pace, so you might get a

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longer, slower response, but it gives that student an opportunity to do that and not worry so much about focusing on their printing or their typing. And it does improve the clarity of the answers.

[SLIDE - Important Web-based Recording Tools

[Text on slide:

Google Apps/Add-ons

- ScreenCastify

Other

- Vocaroo
- Voice Notes (feedback)]

[Richard]: So important web-based recording tools, Google Apps and Add-Ons, it's an extension called ScreenCastify, which is great. There's a voice recorder called Vocaroo, it's a website, and then there's Voice Notes, which is built into Read and Write, and I use that more as a teacher-descriptive feedback, and I'll show you all of these. The one downside is this computer I'm on has run out of operating system memory. I spent a couple hours trying to free it up, and it would not. So I will show you what ScreenCastify is, where it is, how to use it, and then I'll show you a quick video of what that might look like from the student. So I do apologize for that, just technical difficulties on this very old computer. We tried with the Chromebook and it just wouldn't go either. Up here in this bar are what are called extensions for Google Chrome. This one here is called ScreenCastify. How you get that is you go into the three little dots here, and you can go to more tools, extensions, or you can go to just the Chrome store. We'll do that way. Here you go, Chrome webstore, click on it, search the store for ScreenCastify, and you find it. ScreenCastify Lite is free, which is great. So you can see mine's added, but when you would do it, you would click add to Chrome and it would pop up in here. If your URL bar goes all the way across and you don't see these, then you click on the three dots, and you would find them up in the top here. So what you would do is you click on that, it pops up, so I'll show you how to start, and you would go record desktop, and you go record, and you go to share, and you can see down here I've got low disc space, so I can't actually show you, but let's pretend, let's pretend it's recording. So it'd give me a countdown, three, two, one, and how I use it is, I would go to this great website here, maybe, called Math Learning Center. And they've got all these great free apps you can see that students can use online. Also great when you don't have access to as many manipulatives in your school, and you've got students on assisted technology. So let's use this Geoboard one. So again, you click ScreenCastify, you ask to record, it counts down three, two, one, the student clicks on Geoboard and they open the web app. And you've asked them to make a right-angle triangle. So the student is recording and explaining their thinking. So Mr. Parker, you asked me to make a right angle triangle, so I'm gonna take this here, and I'm gonna make it like this. I take another rubber band here, and I'm gonna make it like that. I'm gonna take one more here, I'm gonna make this one red though, Mr. Parker. Make this one red too, and I'm gonna take a yellow one, and drag it down here. So the reason that I made these two red is because this, Mr. Parker, is a 90-degree angle. It makes an L. It's like a corner of a square. That's how I know this is a right-

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angled triangle. It a triangle 'cause it's got one, two, three sides. So it's got a 90-degree here and it's got three sides. That's how I know it's a right-angled triangle. Then he'd hit stop recording by clicking up here this little red button, and it would go to a page where they process the video and it's stored in their drive. So if they went to their drive, it automatically creates a folder called ScreenCastify, and in there it has a bunch of different videos that are created. So I had made one on a test, so here's the video that I made. So we'll open it and you can see what it would look like when the student shares it with you. And the student makes the right-angled triangle. Let's do this here, actually I'll use this here. So the student might be talking like this, or they might not be. You wanna get them talking at the end though, as they make their triangle. So I would say, Mr. Parker, this is a right-angled triangle. I know it's a triangle because it's got three sides. So there's one, two, three. And the student might label 'em. So one, oh, it doesn't wanna work, sorry we're not gonna do that part. So anyway, as I was saying, this is a triangle. It's got three sides and... you asked me to do a right-angled triangle. I know this right here is a right-angle. It makes an L. So you get the gist of that, you can see how it records their voice while they're moving around the computer doing something on the tab, which is awesome. So how would they share that with you? What they would do is they would go into the drive where they've got their video, and they can hit this little guy with a plus, this little person, or they can right click and hit share, and they would type your name. So I'll share it with myself. So I'll share it with that one there and then it sends it and it would be in your drive now. And you would just have to look it up in recent shared with me. It would be one of the top ones. And you could watch their video, you could ask them what the title is and you could search it in there, and it would pop up in there for you. So that is one way of using ScreenCastify. I'm gonna talk about how to use it later on as well with some other websites.

Vocaroo, Vocaroo is a really neat... ..voice recording and it's web-based. So this is Vocaroo here, vocaroo.com. You have to click to enable Flash to allow it to record your voice. And we're going to look at this voice recording question here. So what we do is here we are taking away the student's need to write to explain their communication and we're gonna give them a chance to speak their communication here. So the first part is what is five times four? If you know five times four, what else can it help you answer? So we are going to record that in Vocaroo. So we go to the Vocaroo website, we click to record, and we have to allow it again. So it's one of the things to make sure students do, 'cause if not they're gonna say it's not recording, not recording. So just teaching them how to make sure they click on the permissions. All right, Mr. Parker, you asked me what five times four is. I know five times four is 20. How do I know this? Well if I skip count, it's a strategy you taught me, if I skip count by fives, five, 10, 15, 20, I know that four groups of five is 20. So five times four, 20. You also taught me that I can flip the numbers around. So five times four can help me answer four times five. I also know if I add one more group of five it's 25, so there's a couple things that it can help me answer. Click to stop. So the student can listen back to it, make sure they've done it right. They can record as many times as they like. There's no limit, but if they're gonna do multiple recordings to send you, they do have to save every time, so we're gonna click here to save. And it gives a nice little URL, so we copy that, I control-C, and we go back to the question, and we paste it, and this link here now takes me, the teacher, to that website, their Vocaroo, and I get to listen to that exact recording. So it's a nice way for the student to share their communication. Also awesome in questions that we're not looking at marking writing. So science responses, social science, even reading responses when we're not looking at marking, assessing the writing piece. We can use Vocaroo in a lot of different places across the curriculum. So now, I can listen

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to it and give them feedback. And for students who are going to speed over my feedback, not read my feedback, or maybe not comprehend my feedback, I have started using in Read&Write documents, I could use Vocaroo too, by the way, but in Read&Write documents I leave voice notes. So in Read&Write, the tool bar up here, this little one here is a voice note. It's only a minute long, so students could do responses there, but if they are going to take a longer amount of time to record an answer, they might run out and get frustrated, so that's why I use Vocaroo. It doesn't seem to have a maximum time. I had students do a 15-minute podcast on it one day, so it doesn't seem to stop. So let's give a response to this. Let's say we listened to this answer. They were really thorough and accurate, so I highlight it, I click on my voice note, and I click here to record.

Hey Johnny, great answer. I really liked how you explained your strategy of skip counting by fives, that's awesome. I also really appreciate that you were able to comment on how five times four and four times five can be flipped and are related, but then you actually added an extra one as well, so you really showed me how five times four can help you answer a couple questions. Great work, keep it up. I stop. I can listen to it, make sure it's fine. For matter of time we're not going to, but we're gonna insert. And you know it's inserting when you see these colors working along the bottom. Sometimes it does take a little bit. This time it didn't, which is great. This'll pop into a play, and then when you return this document to the student, and you encourage them to listen to your feedback, they can listen to you and hopefully comprehend what you're saying, as opposed to trying to read your words and break down what your descriptive feedback was. Again, great in science, social science, reading responses, anything where your assistive technology students are using a Google document, the voice notes is a great tool.

[SLIDE - Let's Look at]

[Text on slide:

1. Screen Castify
 - Chrome Add-on
2. Vocaroo
 - Web-Based
3. VoiceNotes
 - Read and Write toolbar

[Richard]: Okay, so those are some of the important web-based tools, and I will talk about ScreenCastify a little bit later again.

[SLIDE - Math Learning Center Apps]

[Image of an American flag

Text on slide: Link to Math Learning Center Apps website

(<https://www.mathlearningcenter.org/resources/apps>)

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- Visual-Motor Skills
- Visual-Spatial Skills
- Memory
- Processing Speed
- Executive Functioning

Web-based and Apps

- Fractions
- Geoboard
- Math vocabulary cards
- Money pieces
- Number frames
- Number lines
- Number pieces
- Number racks
- Pattern shapes

Use with ScreenCastify...CAPTURES THEIR THINKING..,

[Richard]: We looked at math leaning center apps already.

[SLIDE - Math Learning Center Apps]

[Text on slide: Mathies Image of a Canadian flag. Link to Mathies website (<https://mathies.ca/>)

- Designed for Ontario classrooms
- Offers a variety of:
 - o Games
 - o Learning tools
 - o Activities
 - o Teacher resources
 - o Home supports

****Using ScreenCastify to have a student talk while they play a game/use an online resource...

Text on slide: National Library of Virtual Manipulatives. Link to NLVM website (<http://nlvm.usu.edu/>)

Image of an American flag

NLVM

- Created in the USA
- Similar to Mathies in that it offers:
 - o Online Manipulatives
 - o Divided by grade level and strands



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**Limits – not all compatible with Chrome

*** Using ScreenCastify to have a student talk while they play a game/use an online resource...]

[Richard]: A couple others, Mathies is a Canadian one designed for Ontario classrooms. It offers a variety of games, learning tools, activities, teacher and home supports. There are things that you can print out. Again, I said tied with ScreenCastify right here. You can have them play a game explaining their thinking, so if we go to Mathies, and we click on games, we could quickly do... I had a good one that I looked at earlier that was nice and simple. Let's do Diamond Drop Whole Numbers. Again, they'd start, we'd allow Flash, this game would open up. We would start.

[Game]: Pick a level to start a new game.

[Richard]: They get to pick the level. Before they picked their level, you would have them go up here again, click ScreenCastify, start recording, and then while they're playing the game, it would be recording and then you would have them explain. This might take a little bit of training, but you could get the students really doing some great explanation while they play. Let's just play 30 seconds or so.

[Game]: Complete as many true statements as possible before all--[

[Richard]: So I'll move this here. Actually I'm gonna change this one. I went the wrong way. There we go. I know 19 is less than 30 because 30 has a three in the tens column and the 19 only had the one in tens column. Same here, 34 has a three in the tens column and a four, so I know the four in the tens column made it greater, so that's why 47 was greater than 30. Oh, 19 and 19, they're both equal. That's pretty obvious. They're the same number. We'll end game there. You can see how they can talk. This game's a little fast, so it's not the best example, but it's not a bad example, and the numbers do sit along the bottom for them as well. There's Multiplication.com and other games out there that they could play and explain their thinking while they're playing and recording using ScreenCastify. That's Mathies. The American version is a bit more in-depth. It's called The National Library of Virtual Manipulatives. You can see they break it down by strand and then grades. I'm not gonna go into that website. You guys can play around with it if you'd like, but they do have some neat games and manipulatives as well.

[SLIDE - Google Draw]

[Text on slide:

- Language
- Visual-Spatial
- Memory
- Processing Speed
- Attention
- Executive Functioning

Uses:

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- Graphic Organizer
(<https://drive.google.com/drive/folders/0BxjqHDjmB7BRVmhWNkZQcFBEcTA?usp=sharing>)
- Mind Mapping
- Posing Questions
(https://docs.google.com/document/d/1pDASWIANfJKryMXkwd_3bBu2kDO7Q9Oxycrj5x5w9LM/copy?usp=sharing)
- Interactive Anchor Charts
(https://docs.google.com/drawings/d/1K3kLKe7E2RR8G2rfUqT7n4xBtgTtxY_EvRlguVkyBqM/edit)
- Anchor Chart #2
(<https://docs.google.com/drawings/d/10LMUyMI5hkoiSI5KxVefFicoetgHo1pxb5QOZNdtoM/edit>)

[Richard]: Okay. Let's go onto our next one here, Google Draw. So Google Draw, it's really great. It's like MS Paint, and it's got some really neat ways that you can create either graphic organizers, students can create mind mapping, you can pose questions on there for either short homework questions or exit passes, and you can create some interactive anchor charts, so let's have a look at some of these things that we'd use. The graphic organizer. This is one right here. This is GRASP. This is what I use. Some people call it GRASS. In it, I put a question up top, and I would share this through Google Classroom with the students that either are on such technology or if we have computers in the classroom that day, I might share it with the whole class, and they've gotta go through the given, the required, the analyze, the solve, and the paraphrase. You can see I've given Vocaroo links here so the students don't have to worry about typing it. They could just record their answer and put that link right in here. The question is 25 students, only five can be in each boat. How many boats? The student would go through what do they need to know, what do they know, what do they need to find out, how're they gonna do it, and then they solve it up here. They could, if they're using Chromebooks or if you got little cameras in your class, they could take a picture with their webcam and drop. If they drew it out, they could insert the picture right here and solve it. They could also go up into the shapes. So we go into the shapes. Let's make, we've got... We don't know how many boats there are, but we do know there are 25 students. Let's make some boats. There's some boats, and I've got 25 students, so they might go right here, and they might make a circle, and we'll make the circle red, and they go Control-C and then make 25 copies. I'm not gonna do it all, but then they would drag it over, so maybe they'd be grouping their boats and the people in the boats. That might just be one way that they're showing their work. There's lots of different options they could do here. Like I said, they could do pictures, they could speak it if that's one of your options you want them to do, but we tend to like them to do some visuals here, so they're creating their picture, and then down here they could paraphrase their answer with Vocaroo. Again, I didn't complete the question, but a very short quick way that you could use Google Docs to create an organizer that can help them solve some word problems. The other options I had was posing questions, so if we go here, and you guys do have access to this on Google Doc. It's using Google across the divisions, sort of breaking it down. Okay, so we're gonna look at the 10 frames here. There we go. Again, it's a Google drawing. I made the 10 frames. You can see I solved this one earlier. Three plus seven equals 10, so you give the students the five dots or one dot or whatever it is that you want them to do,

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and you give them a selection of red dots, just like I did before. I made one dot, then I went copy, paste. I would go Control-V like 20 times, 30 times, 40 times, just spread them out. Again the great thing about this is once you've made one copy, you can go file, make a copy, and then change the numbers here, and you can have multiple ones at different times for the students. That is a way of using 10 frames. Using Google Drawing to drop an image in, I used the lines here, see, these are your line segments here. You can see I used them to go up and down and across here to give the length, the width, the height. I gave the formula here, and the student has to show their work down the side here of how they solved this math question to find the volume of the fish tank. Again, exit pass, possible homework question, just one quick question just to keep them on task, whatever you need. Again, you have access to this using Google for Math, so that will help you access a bunch of different questions, depending on what division you are in. All right, the anchor charts. I'm only gonna show one in the sake of time. Here is a nice little anchor chart you might, I actually did copy this from a wall, make it my own a little bit with different numbers, add different images, and also you can see here these are live links to web pages, and this is a video here. It's an interactive anchor chart because it takes them from your page where you're giving them the fraction, the image, how you turn a percent, how you turn a decimal, but you also can send them to external areas to look at videos and images.

[SLIDE - Word Problems]

[Text on slide:

- Phonological Processing
- Language
- Memory
- Processing Speed
- Attention
- Executive Functioning

Students with Language Based LD will struggle with word problems

So why are we giving our students with a learning disability the same word problems as our students who do not have a learning disability?]

[Richard]: Okay, let's continue on here. We looked at word problems earlier when we looked at the GRASP organizer. Students with language-based learning disabilities will struggle with word problems. My question is why are we constantly giving our students with a learning disability the same word problems as our students who do not have a learning disability, who do not have a challenge with reading?

[SLIDE - Word Problems]

[Text on slide:

- Phonological Processing



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- Language
- Memory
- Processing Speed
- Attention
- Executive Functioning

As in language, more words in word problems confuse many students with Learning Disabilities. John Mighton has a suggestion in his book “The Myth of Ability”. On page 137 he gives a tip on how to reduce words in word problems. Let’s look at the typical way we might present a word problem.]

[Richard]: When we're looking at math, I question what are we assessing here sometimes when we're given these big crazy word problems. As in language, more and more words could confuse students with learning disabilities. In John Mighton's book on page 137, he gives a great tip on how to reduce words in word problems, so here's one way we might typically see a standard textbook example.

[SLIDE - Standard Textbook Example]

[Text on slide: It is a warm July Day. There is a party at your family’s cottage. There are 20 people at the party from your family. There are 5 boats that are going to carry everyone out to the island. How many people will fit in each boat?]

[Richard]: It's a warm July day. There's a party at your family's cottage. Right there, no math yet. There are 20 people at the party from your family. Okay, we're starting to get into some math now. Five boats are gonna carry everyone to the island. How many people are gonna fit in boats? A lot of students, we're gonna lose up here in this first part. Where's the math?

[SLIDE - Example]

[Text on slide:

- *Phonological Processing*
- *Language*
- *Memory*
- *Processing Speed*
- *Attention*
- *Executive Function*

20 people

5 boats

How many in a boat?

What are we assessing? Math or language?]

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[Richard]: Here's the question again, and here's what we can do to break it down. We cross out all these words we don't need for the students to worry about. They're anxious when they see this size of word problems. Now we're feeding into anxieties, and if we break it down like this, there's the question. 20 people, five boats, how many in a boat? It makes it much easier and it focuses on math. Again, you already have this typed out on a Google document for your students with learning disabilities and IEPs. All you have to do is make a copy and start erasing a lot of the words. So again, like I said earlier, what are we assessing here, math or language? The language really challenges a lot of our students.

[SLIDE - Project Based Learning/Inquiry in Math]

[Text on slide:

- Phonological Processing
- Visual-Motor Skills
- Memory
- Processing Speed
- Attention
- Executive Functioning
 - o Lists
 - o Chunking
 - o Timelines

Project Based Learning is a method where students gain knowledge and skills by tackling a challenging question or problem. In math, the challenge is usually around a real-life problem that the students can relate to.]

[Richard]: Okay, project-based learning and inquiry in math. This is a great way to attack multiple parts of your curriculum, not just in math. Project-based learning, or you might hear of something called PBL. It's a method where students are gonna gain their knowledge and skills by tackling a challenging question or problem. In math, the challenge is usually around a real-life problem that students can relate to.

[SLIDE - Sample: Planning your Dream Vacation]

[Image of a yellow, toy van on the beach

Text on slide: Grade 5

Students are given \$15 000 in order to plan their dream vacation

Requirements

- Research places
- Collect Research

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- Budgeting and Planning
 - o Hotel
 - o Food
 - o Travel
 - o Excursions
- Create final presentation

** Able to assess learning skills galore]

[Richard]: I came up with this sort of challenge for a Grade Five teacher, and I said, "You don't have to do all this. You can pick and choose what's important for you," and you'll see what I mean when we go to the next page. In Grade Five, students are given \$15,000 in order to plan their dream vacation. They've got to research places, so there's some language expectations. They've gotta collect their research. They've got to budget and plan, how much is your hotel, what's your food gonna cost you, where you gonna go, how much is it gonna cost you to get from here to there, what excursions are you going to, and then they've gotta create a final presentation. Lot of great access to learning skills here as well.

[SLIDE - Sample: Planning your Dream Vacation]

[Image of a yellow, toy van on the beach

Text on slide: Curriculum Connections

- Number Sense (Decimals, +-x/, Place Value)
- Measurement
 - o Distance Conversion
 - o Area and Perimeter of a park, building etc.
 - o Elapsed Time
- Graphing (optional)
- Reading (Research) and Writing (Persuasion, Explanatory)
- Social Science (Government/History (Gr. 4))
- Art
- Technology
 - o Research (Reading)
 - o Organization/Mind Mapping (MINDOMO)
 - o Creating a Presentation/Poster etc. (Writing, Oral, Media)
 - o Spreadsheets and formulas
 - o Mapping (Google My Maps)

Bonus: So easy to differentiate

- Change dollar amount
- Reduce expectations
- Alter expectations depending on grade level]

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[Richard]: Curriculum connections. We've got some number sense in there, so decimals, adding, subtraction, multiplication, division. You can put some place-value questions in there. You've got distance conversion. You've got area and perimeter. Maybe you have a park. You've got elapsed time, so if you're gonna go from your hotel to the Colosseum, and it takes, according to Google Maps, it's gonna take you 47 minutes to walk there, and you leave at 2:10, what time are you going to get there? You can put some questions like that in there. You can put graphing in there. Again, it's optional. Weather patterns, rainfall, things like that. Tourists that visit the city, busy months versus quiet months. They can learn what high season versus low season means. You can even compare high season, low season, costs of flights. Honestly, there's some reading when they do the research and gathering their notes. You could put some writing in there. Okay, you gotta persuade your parents to take you, or you gotta explain something about that area, so you got some paragraph writing in there. If you're in Grade Four, we'll talk in a minute about how you can modify this question obviously. You get some history in Grade Five. You could talk about what sort of government do they have in place and their history of government maybe. You can include some art that they have to research and recreate from that area, and then using your assistive technology or computers, you've got research mind mapping using Mindomo, creating a presentation. They could include some spreadsheets and formula, again, depending on how deep you get into this, or they could use some mapping skills with Tour Builder or My Maps. Again, lots of really great opportunities here. It's so easy to differentiate. You can change the dollar amount. You can reduce expectations. If you've got students who need more and want to be challenged more, you can give them all of this. Again, Grade level Two, you can change everything based on grade levels, so it's a nice great way to attack a lot of your curriculum with one challenge.

[SLIDE - Sample: On the IEP, this might look like]

[Text on slide:

Learning Expectations (Math):

- Student will research and plan a Dream Vacation, and use their number sense skills (addition, subtraction, multiplication and division) to budget for the trip and measurement skills to demonstrate an understanding of elapsed time and distance conversion.

Teaching strategies:

Memory

- Provide a variety of manipulatives
- Chunk into smaller tasks

Executive Functioning (Planning)

- Co-create schedule for completion of each section

Assessment methods:



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- Utilize a variety of ongoing formative assessments such as 3-2-1, Exit Passes and conferencing to check-in on progress related to specific skill (addition, subtraction, etc.)
- Using a rubric, assess the number sense and measurement knowledge and thinking tasks]

[Richard]: On an IEP, this could look like this. In math, students will research and plan a dream vacation, use their number sense skills to budget for the trip, and measurement skills to demonstrate an understanding of elapsed time and distance conversion. In these teaching strategies, I've tried to put and my IEPs, the skills that we're working on with these, so I've got memory, proving a variety of manipulatives, chunking of the smaller tasks, executive functioning, specifically the planning, so we're gonna co-create a schedule for completion of each section, and then assessment methods, we're gonna utilize a variety of ongoing formative assessments, such as 3-2-1 exit passes, conferencing to check in, related to certain skills throughout the unit, or the tasks, sorry, and then use a rubric at the end to assess the number sense and measurement knowledge and thinking tasks.

[SLIDE - Sample: On the IEP, this might look like]

[Text on slide:

Learning Expectations (Language):

- Student will organize their research for a Dream Vacation project using Mindomo
- Student will create a final product (slideshow, podcast, presentation) in order to present their findings and explain why this would be their dream vacation

Teaching Strategies

Memory

- Give few instructions at a time
- One-to-one teaching of Mindomo

Executive Functioning

- Provide descriptive feedback at every step

Assessment Methods

- Using a co-created success criteria, assess planning
- Provide on-going one-to-one feedback on their final project as they work
- Using rubric, assess final product for knowledge, thinking and communication]

[Richard]: A language, the IEP might look like this. Organize the research for a dream vacation using Mindomo. Create a final product, slideshow, podcast, or presentation, in order to present their findings and explain why this would be their dream vacation. Again, teaching strategies are broken down into memory and executive functioning, give a few instructions one at a time, one-to-one teaching of Mindomo, provide descriptive feedback at every step for the executive functioning skills, and again the

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assessment, co-create a success criteria, one-to-one feedback on their final project as they work through it, and then a rubric to assess the final piece.

[SLIDE - EquatIO]

[Image of an American flag and the EquatIO logo]

Text on slide:

- Language
- Visual-Motor
- Visual-Spatial
- Memory
- Processing Speed
- Executive Functioning

EquatIO Resources:

<https://docs.google.com/document/d/1RrLDDOWD51m9rVNw3ptkTH3yK22abdIGDwfHskYA3w4/edit>

EquatIO Training Resources: <https://goo.gl/nUVRXD>

EquatIO Youtube Channel: <https://www.youtube.com/playlist?list=PLvSZbmGbKpCRz3o-FmU9AkEpURs9-Z0nH>

EquatIO mathspace item: <https://equatio.texthelp.com/space?open=zw8j-gp5r>

Updates (Scroll Down: [https://www.texthelp.com/en-us/company/education-blog/november-2018/equatio-for-google-meet-equatio-mathspace/?utm_medium=Social-\(organic\)&utm_source=Twitter&utm_campaign=K-12:-Demand-Gen-Schools%7CProduct-Releases-FY19Q1](https://www.texthelp.com/en-us/company/education-blog/november-2018/equatio-for-google-meet-equatio-mathspace/?utm_medium=Social-(organic)&utm_source=Twitter&utm_campaign=K-12:-Demand-Gen-Schools%7CProduct-Releases-FY19Q1)]

[Richard]: Okay, from the wonderful people at TextHelp who created Read&Write, they have got EquatIO. EquatIO is pretty awesome, and they just really worked on it this last year. Let me just get rid of this box here, to make it even better, and this is what I always thought it would be when I first was introduced to it by them. EquatIO is a great way to use a Google Doc and start embedding math manipulatives into it as well. You can see that it recognizes, it pops up here, this document contains math, so they recognize if you've got a document that you've already got maybe made before EquatIO, and that is has math in it. EquatIO has a couple of uses for me. One, we'll do this one first, is the student can use it to answer a question. Again, we've got our 10 square there, and we've put our nice, quick, simple math question, three elephants, two ducks, how many animals? Now, how we get to the EquatIO sort of workplace is we click on this, and I'm gonna go up to my extensions up here again, and this is EquatIO. This is that little symbol right here, so I click on this, we'll see a bar pop along the bottom. I want to go to edit math. What it does is it goes to where a little workspace, and it takes that table and that math that I had, excuse me, and it puts it onto a math space. So what it did is it brought the questions over here for me, which is great. Now the student, who I sent this out on Google Classroom, has access to moving things around here. First they have to figure out what are going to be the



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elephants, so let's make these the elephants. That means these are going be the ducks. Now we go back to my arrow, and the student will move three elephants over, and they will move two ducks, and then you can see, this is very primary, so you can see where you can go with this for other divisions, other grades, and let me count, one, two, three, four, five, so they go back to the freehand, five. All right, so we'll do an equal sign there too. Now this is the tricky part, and it's not that tricky really, but when they go to put it back, they have to, if they leave this box blue here, their answer is gonna replace that, which is no big deal, because the question's still in it, but sometimes you want to have the question there so you can show parents, or if you've got a school team meeting, and you want to show other outside providers what the question was and what the student did, you want to have the cursor down below. It might take a little bit of training for that, but eventually it'll go, it'll click. We go back here and we go right here. It says insert math with this little blue arrow. Circle the white arrow in there. We insert it, it'll put it right back in that document that it took from, which is awesome, and it does it all for you, and there is the answer to the question that you gave them, so that's pretty awesome. The other thing that I do is I create my questions on here. I've got find two clear fractions, but I've got nothing there. If you want to find something that's different and challenging like something that's got fourteenths, you can always find your basic fractions pictures, images, but you also want to watch out for copyright rules, so what you can do here instead is if we open up our EquatIO again up here, and it puts the bar on the bottom, we want to go to the math space. We want to insert a math space. It's gonna open this up for me. I've got nothing here. What's really cool is I've got all these smart shapes and shapes down here. I can do a speech and put a question for them, if they need it. By clicking on the smart shapes, I've got a compass, I've got polygons, we're gonna click on these. I can make different shapes, but I'm gonna go to the fractions. Let's click on fractions, and I'm gonna put my fraction here. Right now, it's, see where I click off it? There's nothing. We want to click on it. This nice little bar pops up here for me. I can change my segments. I want to put 14 segments in there, like I said. I'm gonna make it challenging, and I'm gonna put four-fourteenths, so that way they can make it smaller or they can make it bigger when they do equivalent. I can shade it differently. I can do a whole bunch of different things. I can put a label on there. The label might be the question, I don't know. You can drop a speech in there where you read the question aloud, so there's lots of great things you can do there. I've got it there, so now I just go back to that insert. I'm just gonna take it back and drop it in there. They're fraction bars, there's time, there's, there's number lines, there's a lot of really neat things in there. You've just got to play with it and find out what you're looking for and make it for your grade, so it's really a great tool, and it makes, even if you're gonna print this out, you share this with the students who are using assistive technology, and if math isn't modified, maybe you just print this out for the students as well, and you've got your math test on paper there, and away you go.

[SLIDE - Google Keep]

[Text on slide:

Uses:

- Sharing formulas
- Sharing links to sites/videos



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- Sharing Anchor Charts]

[Richard]: Okay, the last thing I'm gonna talk about just quickly is Google Keep. Google Keep is great for sharing formulas, sharing links to sites, sharing anchor charts. Google Keep is, it's an app, so if we click on Google here, and we click on our apps, it pops up right there, so Google Keep, you click on it, and you can see I've got some math notes already created, and I'm gonna show you the importance of those. I'll show you how to create a note after, but let's go to this Google Keep note here, and I've got this little test that a student might have, and we know that formulas are an issue for students, and you can give them the formula sheet, they lose it. If it's in their drive, they might not be able to find it, plus they've got to go, if you give them a formula sheet on another Google Document, they're going back and forth, back and forth between the tabs, but with Google Keep, the great thing here is, I'll move this down again, there's certain things that pop up along Google, Google Calendar, put Google Keep is right here, so if I click on it, it pops up with all those notes that you saw. If I want to search for one, it's up top here, we're gonna make this, there we go. These have little labels. I'll give you the labels later on. I'll show you how to do that, but if I want to just narrow it down, I want to put math, it gets rid of all the ones that aren't math. Maybe I want to make my label area, and now it's giving me my area notes. When I used to use these, I initially created them for the students, but then my goal is to have them to start creating their own independently, so now they've got to find the area in front of this rectangle, oh, there it is right there for them. Area is your length times your width, length times, oh, so they can put their answer in here. They can do Vocaroo, however they want to do it. Perimeters is you add up all the sides, so four plus 12 plus four plus 12. They've gotta get a calculator maybe, but they add it up and they put their answer below. Again, I use this in language for writing tips for writing process, a lot of neat little things, multiplication tips. You can put a link to a video in here again as well if you want, almost like we did in the interactive anchor chart. How do we create these? Well, if we go back to Google Keep. We'll click apps, we'll click Google Keep, all right, taken out, so you get the title. We'll just call it area this time. You put your area equals length times width, and the important thing is the label, so we go to three dots here and we want add label. I've already created a couple here. I want math, I want formula, and that is good enough for me, so there's my formulas. There's my label, sorry, formula, math. The student knows that it's a math or it's a formula one. You can add images again like I said, so you can add an image that you've got of a square with the sample below, you can add that, and when you share with students, you go collaborator, so I'll share it with myself again, and you share it with the student, and then save.

Here's the tricky thing. If you share this with four or five multiple students, and you've got that one student who likes to be bit of a joker, you've lost control over the Keep note. They can all add to it, change it, write something on it, eliminate something, erase it all together, so you want to make sure that you're sharing it with the few students that need it or you make the same note five times and you share it with five different students. That way, if they want to goof around on their own Google Keep note and erase it, then that's their loss and that's their lesson learned. Like I said, I do this to begin my year, and my goal as I get going through the year is to have students creating their own notes, so they have access to it themselves and them only, and I don't have my ton of different notes, as you can see, on my Google Keep page.

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[SLIDE - Financial Literacy And Using Technology]

[Text on slide: [Ministry of Education](#)]

Project Based Task

- Make Financial Decisions
- Understand money management

Recording Student Thoughts/Responses

- Gives you a greater understanding of their knowledge and thought process in relation to money related questions/challenges

Equatio/Mathies/Google Draw (paired with Text to Voice and Voice to Text apps)

- Allows you to create problems and challenges, and gives students with Learning Disabilities access to the tools to hear and answer those questions using technology, thus leveling the playing field]

[Richard]: The last thing I just wanted to talk about, and the Ministry asked me to just touch on this briefly is financial literacy and using technology. Financial literacy is a mandate of the Ministry, and when you look at the project-based task, we are hitting some of that when we are looking at them making financial decisions and understanding money management, so if you've got \$15,000 for a vacation, you've got to learn how you can fit certain things in and maybe you can't travel first class. Recording student thoughts and responses gives you great understanding of their knowledge and their thought process in relation to money-related questions and challenges, so you get to listen to what they're thinking when they're doing the money questions, and EquatIO, Mathies, Google Draw, even games to do with money, paired with text to voice, voice to text, apps, or ScreenCastify, you're creating problems and challenges to give students with learning disabilities access to the tools to hear and answer those questions using the technology, therefore you're leveling the playing field, and you're giving everyone sort of that equal opportunity to answer those questions that have to do with the financial literacy. So thank you for joining us. The rest of the slide deck are some other websites you may be interested in looking at, some other resources that I have, as well as the link to the padlet right here, and that gives you access to this deck, as well as any other things that I've shared and talked about. Thank you very much.

[SLIDE - Q & A]

[Image of a purple speech bubble with "Q & A" written inside]

[Cindy]: Thank you so much, Richard, for sharing your knowledge and expertise, and providing our webinar participants with in-depth practical suggestions and strategies to manage anxiety in students with LDs and using technology to support and enhance their math learning outcomes.

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Okay, let's move on to the Q&A part of today's webinar. If anyone has questions, please type your question into the box on your go-to webinar dashboard, and I will read your question to Richard.

[Susanna Miller]: All right, so our first question was about using multiple programs at once. You showed us how to use math games and ScreenCastify at the same time. Can you use the Google Read&Write voice note function with Mathies?

[Richard]: No, the voice note option is only to be used on a Google Doc, so you'd have to use a different, you could maybe use Vocaroo but the voice note option is only a Google Doc tool.

[Susanna]: Okay. All right, next question. Once you have a Google drawing created, how do you share it with your students?

[Richard]: I share it using Google Classroom, and I either make a copy for all students. If it's something that they have to answer, and if it's something that they just need to look at, I would share as if you only, so they could manipulate it or do anything with it. They'd just look at it, and they can still access the live links on there, so it doesn't change that, but they also can't move things around by mistake or on purpose.

[Susanna]: Okay, great answer. With the presentation, did you create it in Google Draw or EquatIO, or what program were you using?

[Richard]: The actual presentation itself was a Google slideshow, and then the supplementary links and things that I shared would be whatever, so if I shared something using EquatIO, that was done on a Google Doc using the EquatIO extension. Google drawing was on Google Drawing, and so on, so the actual slide deck is, no, a Google presentation.

[Susanna]: Okay, thank you. This teacher says, "I don't have much of a budget for assistive technology at my school. Where can I find a list of free web-based programs?"

[Richard]: That one was a tricky question, because there's no list that I have found. Sometimes reaching out to your tech leaders at your school board, so for example in Halton, we have a few assistive techs. They're called IPLs or assistive tech leaders, and they may have put that sort of list together, or it's maybe just talking to other special education teachers around your board or maybe coming up with a shared list that you can just add to and share with each other every time you find one.

[Susanna]: And if teachers want to get in touch with you, are they able to do that?

[Richard]: Yes they are.

[Susanna]: Okay, and the best way to do that is Twitter or, what do you think?

[Richard]: My email if it's on there, they can reach my email, or it's just through the Twitter @teacherparker, one of the two.

[Susanna]: All right, okay, I think we have time for one last question. This viewer asked, "Can the programs you shared today be used with all grade levels?"

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[Richard]: I believe they can. It's up to the comfort of the teacher sometimes, but I do believe, and the tech, how much technology you have and how much access you have, too, because the more students are on technology, the better they are with it, but I believe this can be used for all grades. The challenging ones will obviously be the K and Ones. I believe with some practice, a lot of the things could be. EquatIO might be the more challenging one, actually, but the other ones all have games and links to grade-related tasks for those specific grades.

[Susanna]: All right, that's all the time we have for today, so we're gonna end our question and answer session at this time.

[SLIDE - Other Questions]

[Text on slide: Email: info@LDatSchool.ca

Twitter: #LDwebinar

Image of three question marks inside circles]

[Susanna]: Should you have any further questions or anything you think of at a later date, you can always email us at info@ldatschool.ca, or use our hashtag on Twitter, #ldwebinar, and I'll be sure to make sure that your questions get answered.

[SLIDE - Other Questions]

[Text on slide: Upcoming webinar:

FREE WEBINAR! The SLP in the Math Class: Empowering Math Learners Through Collaboration Between Educators and Speech Language Pathologists

June 5, 2019 3:45 – 4:45 pm ET

Presented by: Sabrina O'Keefe, Speech Language Pathologist

Private Practice, Trillium Demonstration School 2015-2017

Image of cartoon brain wearing glasses with one hand raised and the other hand holding a megaphone. There is a speech bubble coming out of the megaphone that contains math symbols.]

[Susanna]: Be sure to mark your calendars for next LD at School webinar which is gonna be taking place on Wednesday, June 5th. Sabrina O'Keefe will be presenting "The SLP in the Math Class, Empowering Math Learners Through Collaboration Between Educators and Speech Language Pathologists." Directly after today's webinar, you'll be receiving an electronic link to register for this upcoming webinar, or you can use the link at the bottom of the screen.

[SLIDE - Educators' Insitute]



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[Text on slide: August 20th & 21st, 2019

Hilton Mississauga/Meadowvale

SAVE THE DATE!

Image of the LD@school logo]

[Susanna]: Please also mark your calendars and save the date to join us at LD at School's Sixth Annual Educators' Institute, which will be held on August 20th and 21st in Mississauga. Information on the program, registration, and hotel accommodations are on the LD at School website now, and public registration will be opening in June.

[SLIDE - Thank you!]

[Text on slide: Thank You!]

[Susanna]: On behalf of the LD at School team, I'd once again like to thank Richard for his presentation, and thank all of you for participating and joining us today. Please remember that we'll be sending out presentation slides and a short survey following today's webinar. The feedback we receive through this survey provides us with important information for producing future webinars. As a reminder, we'll be sending out the link to this recorded webinar in appropriately three weeks. Thank you again for participating, and enjoy the rest of your day.