2013 Minnesota Council of Teachers of Mathematics/MDE District Leadership Task Force

Mathematics is the Study of Patterns

#	*The top 6.5 things holding back student achievement in Mathematics* **Description**	*& what to do about it* **Action Items**	*What might this look like in my building or district?* **Self-Reflection**
1	**Challenge:** The Structure of the Day/week/year isn't meeting student or staff needs for learning and teaching quality mathematics. **Vision for Success:** All students deserve to learn important and challenging mathematics every day – at least 60 minutes of core instruction and 30 minutes of targeted instruction.	• **Check the time allotments for mathematics in each of your grades.** • How can you craft the 30 minutes of targeted instruction? What other staff can you engage? • Are targeted groups pre-set for large periods of time or do they change frequently and flexibly based on student needs and solid formative assessments? • Examine how well you are guaranteeing students have the opportunity to learn core content during the 60 minutes of core instruction.	•

2	**Challenge:** We don't know what we don't know about good math instruction.
	
	Vision for Success: All sites will provide **intentional/directed PLC time** around Content Knowledge AND Pedagogy.
	- Excellent Mathematics teaching values conceptual development over doing procedure.
	- We know the 3 large math concepts students struggle with in PK-5. What is your site doing to build staff skills in these areas?
	  • A flexible understanding of the base 10 number system (place value)
	  • Relational Thinking (a deep understanding of equality)
	  • Rational Numbers
	- PK-5 teachers need to develop a broader understanding of how children think about mathematics. Does your staff understand the stages students pass through in their development of mathematical understanding?
	- You get better at what you focus on. Have you invested a similar amount of time in addressing best practices in math education as you have in literacy?
		• Are your teachers teaching a balance of skills and concepts?
		• Do an audit of the amount of PD your site has received in mathematics in the last 2 years and how much time they spend jointly planning mathematics lessons. Is this amount equivalent to the amount of time spent on literacy? If not, make a plan to address this.
		• Does your staff need support on one or more of the 3 big math concepts that students tend to struggle with? If so, where can they go to get support on this. (perhaps a book study on one of suggested book resources)
		• **Schedule 60 minutes at least 2 times a month to build staff content knowledge and math pedagogy.**
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3	**Challenge:** Math Teacher Leaders are not being identified, utilized and developed. **Vision for Success: Teacher leaders will be identified** who will work in partnership with administration and a math committee to improve mathematics teaching & learning. *By looking at the support systems you have in your building around teaching and learning mathematics, you can intentionally develop your teachers' capacity to lead change.*	• Use Lenses on Learning professional development materials to reexamine assumptions about mathematics teaching and learning www.mathleadership.org look for Lenses on Learning. • **Looking for help with Professional Development?** Feel free to contact any one of	• Who are the 2 people in your building who are math leaders • How will you allow them to lead?

		us, but here are some other people who can help point you in the right direction: MDE Math Specialist, Sue Wygant susan.wygant@state.mn.us MCTM Executive Director, Tom Muchlinski tmuchlinski@earthlink.net or Current MCTM President, Michele Luke michele_luke@hopkins.k12.mn.us • **Attend the MCTM** Symposium and Spring **Conference** April 25, 26, 27. www.mctm.org	
4	**Challenge:** We are not teaching the right things. **Vision for Success:** Students will not only have the opportunity to learn the skills and procedures of mathematics but will also develop **strong conceptual understanding** and apply that understanding to solve problems. - *Find balance in the teaching and learning of mathematics to include not only the skills and procedures of mathematics but also deep conceptual understanding.* - *Take some time to consider what it takes to Meet or Exceed the MN Academic Standards---it's deep conceptual understanding.* - *Online tools and Apps are often structured to provide practice in basic facts and simple procedures. Do not let the use of these tools take away from time spent on developing conceptual understanding.*	• Have your teachers **read their grade level standards at least 3 times** this year? • Utilize resources from NCTM and professional literature to develop strong understanding of what best mathematics teaching practices look like: "Helping Children Learn" National Academies Press "How the Brain Learns Mathematics" Sousa "Teaching with the Focal Points" NCTM	•
5	**Challenge:** We don't have solid diagnostic evidence of student understanding. **Vision for Success:** • We have a deep repertoire of **formative assessment** tools • We use information from formative assessments to drive and personalize instruction • We assess both conceptual and skill knowledge	• At a staff meeting have different groups study one of the strands of the **Achievement Level Descriptors** and discuss the Reflective Questions on the sheet (ALD forms on our websites) • During a PLC or grade level meeting review the **cognitive complexity** of assessment items and look for items that increase cognitive complexity	•
6	**Challenge:** We do not have enough evidence of student thinking. **Vision for Success:** All students are talking about mathematics out loud every class period. - The number one question we want someone asking when they are observing a mathematics lesson is **"Who is doing the talking?"** - Do teaches have time to plan quality questions that will surface student mathematical thinking?	• Tell teachers you will be looking for who is doing most of the talking in the classroom. • As a staff read ***'Never Say Anything a Kid Can Say!'*** By Steven Reinhart (NCTM). • Make it a goal that every math lesson has multiple student turn-and-talks with a shoulder partner. • Make space daily for all teachers to plan questions for their math lessons.	•
½	**Challenge:** We're not sure where to start. **Vision for Success:** If in the next 24 hours you make plans to implement one or more of these suggested action items, you are halfway there by choosing one of these strategies to implement.	• Schedule 15-30 minutes per month on your calendar to intentionally plan how to improve mathematics achievement at your site. • Take action on 1 of the action items listed above in the next 24 hours.	•

Bonus 1	**Challenge:** Teachers define textbooks as 'curriculum'. **Vision for Success:** Curriculum = Standards (specifically the 2007 Minnesota State Mathematics Standards)	• Bookmark and explore SciMathMN Frameworks for Mathematics and Science at www.scimathmn.org/stemtc • Every adult reads the standards 3-4 times a year. Everyone. • Check out the cognitive levels in standards and benchmarks at a grade level.	•
Bonus 2	**Challenge:** Adults personal attitude towards math influences students personal believe about mathematics. **Vision for Success:** All students and adults have a positive attitude towards mathematics.	• Every adult commits to never saying any version of a statement like "I was never good at math" and calls out anyone who does say something similar. • Commit PD time to learning about a fixed vs. growth mindset (Read ***Mindset: The New Psychology of Succes*** by Carol Dweck) • **Beloved Child Activity** - Take a trip down Memory Lane and into the Future – on a PD day have groups of 4-6 participants pause and silently think about their memories of math. Each group records their thinking on chart paper and posts it with a short summary of it. Then, give time to silently think about a beloved child (one's own child, grandchild, nephew/neice, student, etc.) What memories would you most want this beloved child to express if he/she was sitting in this room 15-20 years from now recalling his/her experiences with mathematics? Each group charts out their ideas, posts and summarizes. Compare and contrast the 2 types of posters.	•
Bonus 3	**Challenge:** Students MCA test scores do not reflect their understanding of mathematics, but rather their lack of skills testing in an online environment. **Vision for Success:** All students feel confident using the online MCA testing tools (calculators, formula sheets, etc.…). Students enter testing day with confidence and committed to do their best.	• Every adult in a school building should take (not just look at) a full grade level online math item sampler at the AIR website. We are confident those who do will leave the experience with lots of ideas for how to support all the students in the school on the next MCA assessment. • Consider giving the OLPA at grade 3 to introduce students to the online experience before it is 'high-stakes'.	•
Bonus 4	**Challenge:** It has been awhile since I taught math. What should I look for when I observe a standards-based mathematics lesson? **Vision for Success:** Administrators have a vision of a strong math lesson that includes students doing the thinking and talking. Lessons are not just showing procedural knowledge but show students are learning the concepts in problem-centered lessons.	• Check out the **Classroom Observations charts** under the **parent/admin tab** of the SciMathMN Frameworks for Mathematics. (www.scimathmn.org/stemtc) Search for the benchmark you will be observing in a particular lesson and scroll down to the parent/admin tab. What does the Classroom Observation chart say students and teachers should be doing,	•

		specifically on this set of benchmarks? Use the other tabs for this benchmark in conferencing with the teacher(s).	
Bonus 5	**Challenge:** Our response to the data (OLPA, other standardized assessments) is to spend the 2-3 weeks prior to MCA's to "review" with MCA test prep packets. **Vision for Success**: Teach for understanding every day of the year and use data to provide targeted interventions as you go, or fill the holes of content not been mastered in previous grade levels.	• Some students need specific targeted interventions that will uncover student thinking and then rebuild conceptual understanding. • Teacher should use all of the tools of mathematics, including manipulatives, at all grade levels to build understanding.	•

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Resources, including today's power point, are located at www.mctm.org/principals.php and

http://scimathmn.org/stemtc/resources/resources-february-2013-mespa-conference-0

Or go to **scimathmn.org/stemtc** --->Resources--->Resources from the February 2013 MESPA Conference (on page 3)

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