Principal Summer Professional Development Series
SPPS Mathematics SY20-21

Schoology Course:
TVNN-8FMH-JFNCC

Link to Slide Deck:
bit.ly/SPPSadmin2020math
SPPS Math Department

K-12 Math Supervisor
Secondary Math Specialist
Elementary Math Specialist
Elementary Math Specialist
Elementary Math Specialist
Math Specialist and Language Specialist
Learning Targets

St Paul Administrators will be able to…

Day 1
- Understand the overall vision and goals of mathematics in SPPS
- Feel confident around EBP’s outlined in their SCIP
- Familiarize themselves with mathematics instructional strategies, routines, and priorities that support efforts with both MLL and CRI

Day 2
- Explore new content written by SPPS teachers in the TQE framework
- Recognize and own their ‘6 Spheres of Influence’ within the teaching and learning of mathematics in their buildings
Math Opener…

Use the next 5 minutes to find any objects in your home / around you to recreate this pattern… Post it here (Padlet)
SPPS Math Overview

2020-2021
Math Vision:
Help SPPS students and staff make sense of mathematics using TQE (Task, Questions, and Evidence)
<table>
<thead>
<tr>
<th>Mathematics Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destination:</strong> SPPS will improve achievement and address students’ social and emotional needs through Culturally Responsive Instruction. We will engage learners in math instruction and encourage a sense of social justice for students, their families, communities, and the world at large. Students will be prepared for and envision themselves in professions of the 21st century. They will be inspired to make the world a better place.</td>
</tr>
<tr>
<td><strong>Stretch Goal:</strong> Saint Paul Public Schools will increase student achievement in Math by 13.9% on the MCA for the 2020-21 school year.</td>
</tr>
</tbody>
</table>
Mathematics Goals Continued….

Smart Goal:
Saint Paul Public Schools will increase student achievement in Math by 1% a year on the MCA starting the 2020-21 school year.
Balanced Math Program

Five Easy Steps
1. Mental Math/Math Review
2. Problem Solving
3. Conceptual Understanding
4. Master Facts
5. Formative Assessments

TQE/NCTM/TM
1. Number Talks/Number Strings
2. Rich Mathematical Tasks
3. Conceptual Understanding
4. Building Numeracy
5. Evidence

Instructional Model

Example:
- **Chew**: Review
- **Chunk**: Review
- **Review**: Ignite
Secondary Math Class

55min Class Period

Closing/Reflection (5min)  
9.1%

Math Review (15min)  
27.3%

Instruction (15min)  
27.3%

Safe Openers

Math Review (15min)  
27.3%

Safe Openers

Instruction (15min)  
27.3%

Math Review (15min)  
27.3%

Safe Openers

Instruction (15min)  
27.3%

Math Review (15min)  
27.3%

Safe Openers

Instruction (15min)  
27.3%
Supporting Teachers with the Instructional Model: Action areas to improve student achievement K-5

Improvement #1  
SPPS Math Review

Improvement #2  
Small Group Instruction (Part II)

Improvement #3  
Independent Student Work (Part II)

Improvement #4  
Task, Questions and Evidence (Part I)

All encompassing improvement:  
**Data Driven Instruction**
Supporting Teachers with the Instructional Model: Action areas to improve student achievement 6-12

Improvement #1: SPPS Math Review

Improvement #2: Independent Student Work (Part II)

Improvement #3: Small Group Instruction (Part II)

Improvement #4: Task, Questions and Evidence (Part I)

All encompassing improvement: Data Driven Instruction
### Phase I

**SPPS 2018-2028 Professional Development Phases**

<table>
<thead>
<tr>
<th>Year</th>
<th>School Year</th>
<th>Grade</th>
<th>New Content (2.5 weeks)</th>
<th>Review Content (3 days)</th>
<th>Summer</th>
<th>Assessment (July)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Elementary</td>
<td>Kindergarten</td>
<td>Grade 2</td>
<td>Review feedback on planned lessons, units, and assessments created in previous summer and used in previous school year</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>Grade 2</td>
<td>Grade 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grade 4</td>
<td>Grade 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grade 6 (Math 8)</td>
<td>Grade 8 (Alg. 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grade 9 (Int. Alg)</td>
<td>Grade 11 (Alg. 2)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grade 10 (Geometry)</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>[Grades 3 &amp; 8 present for vertical support]</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Phase I - Year 1**

- Step 1: Gather information from Elementary teachers in cohorts to determine grade level outcomes
- Step 2: Develop Lessons with Secondary teachers in cohorts using Task, Questions and Evidence

**Phase I - Year 2**

- Step 2: Develop Lessons with Secondary teachers in cohorts using Task, Questions and Evidence

**Phase I - Year 3**

- Step 2: Develop Lessons with Secondary teachers in cohorts using Task, Questions and Evidence

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**Notes:**
- New Content (June – 2.5 weeks)
- Review Content (June – 3 days)
- Summer
- Assessment (July)

**Kindergarten**
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Grade 6 (Math 8)
- Grade 8 (Alg. 1)
- Grade 9 (Int. Alg)
- Grade 10 (Geometry)

**Grade 7 (Pre-Alg)**
- Grade 11 (Alg. 2)

**Grade 10 (Geometry)**
- Grades 3 & 8 present for vertical support

**Grade 11 (Alg. 2)**
- Grades 3 & 7 present for vertical support

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**Saint Paul Public Schools**

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Phase II

SPPS 2018-2027
Professional Development Phases/Implementation
Science Stages
Culturally Responsive Instruction

READY for RIGOR
A Framework for Culturally Responsive Teaching

LEARNING PARTNERSHIPS
- Recognize the student-teacher relationship as a partnership
- Take responsibility to reduce students’ social emotional stress from stereotype threat and microaggressions
- Balance giving students both care and push
- Help students cultivate a positive mindset and sense of self-efficacy
- Support each student to take greater ownership for his learning
- Use students’ language to talk about their learning moves

INFORMATION PROCESSING
- Provide appropriate challenge in order to stimulate brain growth to increase metacognitive capacity
- Help students process new content using methods from real traditions
- Connect new content to culturally relevant examples and metaphors from students’ community and everyday life
- Provide students authentic opportunities to practice content
- Teach students cognitive strategies using the brain’s neural learning pathways
- Use formative assessments and feedback to increase metacognitive capacity

COMMUNITY OF LEARNERS & LEARNING ENVIRONMENT
- Create an environment that is intellectually and socially safe for learning
- Make space for student voice and agency
- Build classrooms culture and learning around common academic norms and task structures
- Use classroom rituals and routines to support a culture of learning
- Use principles of restorative justice to manage conflict and reduce negative behavior

Foreword by Yvette Jackson
Culturally Responsive Teaching & the Brain
Promoting Authentic Engagement and Rigor Among Culturally and Linguistically Diverse Students
Zaretta Hammond

© Zaretta Hammond, 2013
www.readyforigor.com
**Culturally Responsive Teaching:**

Culturally relevant teaching is a term created by Gloria Ladson-Billings (1994) to describe "a pedagogy that empowers students intellectually, socially, emotionally, and politically by using cultural referents to impart knowledge, skills, and attitudes." Participating in culturally relevant teaching essentially means that teachers create a bridge between students' home and school lives, while still meeting the expectations of the district and state curricular requirements. Culturally relevant teaching utilizes the backgrounds, knowledge, and experiences of the students to inform the teacher's lessons and methodology.

It’s only culturally responsive if our students are responsive to the strategy, curriculum, or instruction. One strategy may be effective and engaging for one student or student group and not another.

<table>
<thead>
<tr>
<th>Rigor</th>
<th>Relevance</th>
<th>Realness</th>
<th>Relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In what ways will I message to ALL students that they are expected to attain high standards?</strong></td>
<td><strong>How will I make sure the curriculum relates to students’ experiences, interests and backgrounds?</strong></td>
<td><strong>What strategies will I use to make sure students and adults are able to show up as their authentic selves?</strong></td>
<td><strong>How will I build relationships with staff members, students, and families?</strong></td>
</tr>
</tbody>
</table>
| - All students should receive the consistent message that they are expected to attain high standards in their schoolwork.  
- Communicate clear expectations.  
- Create an environment in which there is genuine respect for students and a belief in their capacity.  
- Recognize when standards are met  
- All students should receive the consistent message that they are expected to attain high standards in their schoolwork. | - How does the curriculum relate to students’ experience, interest and background?  
- Students identify issues that are important to them.  
- The classroom recognizes student advocacy for what students need to be successful. | - Are students able to show up as their authentic selves?  
- Do students perceive teachers as authentic?  
- Students engage in the curriculum critically. They question and inquire about what and how they are taught. | - How do we build relationships that are reciprocal?  
- Recognize student contributions to the classroom community and also create an environment where students build relationship with the teachers not just teachers building relationships with students. |
DIMENSIONS OF EQUITY

As equity-focused educators, it is important to distinguish between three key areas in education: **multicultural education**, **social justice education**, and **culturally responsive teaching**. Too often the terms are used interchangeably when they are not. Below is a simple chart to help you understand the distinctions between them. A key point to remember, only CRT is focused on the cognitive development of under-served students. Multicultural and social justice education have more of a supporting role in culturally responsive teaching.

<table>
<thead>
<tr>
<th>MULTICULTURAL EDUCATION</th>
<th>SOCIAL JUSTICE EDUCATION</th>
<th>CULTURALLY RESPONSIVE PEDAGOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focuses on celebrating diversity</td>
<td>Focuses on exposing the social political context that students experience</td>
<td>Focuses on improving the learning capacity of diverse students who have been marginalized educationally</td>
</tr>
<tr>
<td>Centers around creating positive social interactions across difference</td>
<td>Centers around raising students' consciousness about inequity in everyday social, environmental, economic, and political aspects of life</td>
<td>Centers around the affective &amp; cognitive aspects of teaching and learning</td>
</tr>
<tr>
<td>Concerns itself with exposing privileged students to diverse literature, multiple perspectives, and inclusion in the curriculum as well as help students of color see themselves reflected.</td>
<td>Concerns itself with creating lenses to recognize and interrupt inequitable patterns and practices in society.</td>
<td>Concerns itself with building resilience and academic mindset by pushing back on dominant narratives about people of color.</td>
</tr>
</tbody>
</table>

Social Harmony | Critical Consciousness | Independent Learning

Copyright © 2017 Zaretta Hammond. All Rights Reserved
It’s not about civil rights...
Turn and Talk (in the chat)

I noticed… The video makes me feel… Something I am wondering is…
If it’s not about civil rights, what is it about?

As you watch the video a second time, jot down what you notice. Your list might look something like this:

- Powernomics is trying to help black people become competitive in society
- Assistant Secretary of US Department of Commerce
- Florida Department of Education
- Primary problem of slavery has never been addressed

Don’t worry about catching everything, do your best.
What did you notice?
What does this have to do with teaching math?

The Nation/SPPS and our children’s lives are at a crossroads.
Take 5 minutes to stand and stretch
Benchmark Summative Assessments

- **S1/Q1**: 6-8 Weeks of instruction
  - 15-20 Questions
  - 1-2 weeks for reteaching
  - ~5 questions from S1 (old concepts)

- **S2/Q2**: 6-8 Weeks of instruction
  - 20-25 Questions
  - 1-2 weeks for reteaching
  - ~10 questions from S1 & S2 (old concepts)

- **S3/Q3**: 6-8 Weeks of instruction
  - 25-30 Questions
  - 1-2 weeks for reteaching
  - 10-15 questions from S1, S2, S3 (old concepts)

- **S4/Q4**: 6-8 Weeks of instruction
  - 30-35 Questions
  - MCA
Learning Best Practices in Teaching Mathematics

- As a department, we needed to know research best practices in mathematics at all levels
  - Due to our large size, we had to determine how to bring back what we were observing to our teachers
- Minnesota Department of Education
- Minnesota Council of Teaching Mathematics
- National Council of Teaching Mathematics
JUNE 2020

Moving Forward: Mathematics Learning in the Era of COVID-19

THREE AREAS WITH SERIOUS IMPLICATIONS FOR EQUITABLE ACCESS TO HIGH-QUALITY MATHEMATICS TEACHING AND LEARNING

STRUCTURES
What are the equitable structures that will best support students?

TEACHING PRACTICES
What planning and teaching practices will best support students?

ADVOCACY
How can we humanize mathematics teaching and learning?
The Most Effective Teaching Practices
It is essential to use the eight equitable and effective mathematics teaching practices advocated by NCTM in Principles to Actions (2018) regardless of whether instruction is in-person, remote, or hybrid.

• Establish mathematical goals to focus learning.
• Implement tasks that promote reasoning and problem solving.
• Use and connect mathematical representations.
• Facilitate meaningful mathematical discourse.
• Pose purposeful questions.
• Build procedural fluency from conceptual understanding.
• Support productive struggle in learning mathematics.
• Elicit and use evidence of student thinking.

Taken together, these practices support formative assessment strategies. For example, eliciting and using evidence of student thinking requires teachers to ensure all students believe that their mathematical thinking is valued. Effective implementation of this teaching practice includes posing purposeful questions, examining students’ work on tasks, and observing students engaged in doing mathematics.

It is critical that we continue to support students in productive struggle and engage them in meaningful mathematical discourse that happens in and out of the classroom. Students can formulate their thoughts and then record their thinking and connect mathematical representations in a variety of ways, including using tools and devices.
Here’s what the teachers said they wanted...

TEACHER SURVEY RESULTS

• Collaboration
• Engagement
• Creative Teaching/Instructional Methods
• Visual/Hands-On Learning/Manipulatives
• Meeting the needs of a wide range of learners
So we provided this….

Cohort Days throughout the year
Curriculum development/writing
Culturally Responsive work
All District Agreements
ELL Foundations Work
ST Math Trainings
Math Review District Trainings
Desmos Trainings
Lesson Study/Learning Labs Trainings with Solution Tree
Manipulatives Trainings
On-Track Math course unpacking (6th Grade Support Math Courses)
Any purchasing of outside resources
Our Contract to continue work with Solution Tree
Funds to provide math team members with outside Professional Development
And then this happened...

THE WORLD IS TEMPORARILY CLOSED
In the meantime...

How we aim to still support you
Ignite your thinking…
How can your own learning help guide you when coaching, supporting or leading your staff?
In this new time of distance learning also comes with it distance learning and collaboration for staff. Some potential options to consider with our team (based on availability) are:

- Synchronous PD during staff meetings provided by the math team around the EBP you have chosen
- Collaborative planning sessions with grade level groups or grade bands
- Virtual lesson observations as coaching sessions (non-evaluative)
- Consultations between math team members and admin or leadership teams
- Coaching support for admin as you support your staff
SCIP EBP Supports: Choice Boards

Asynchronous Activity
We want to provide you with your own asynchronous learning opportunity today.

‘Learning is a treasure, that follows its owner everywhere.’

Chinese Proverb
SCIP support around our 4 EBPs
...a time to explore a ‘Choice Board’ of the EBP(s) you’ve chosen. To access, lick on the circle or scan the QR code for your EBP(s) below.
If you have specific questions during...
DAY 2
We noticed your wonderings...
**Requirements vs. Expectations**

**Statement**: “Synchronous experiences are pivotal to best practice (math) instruction and learning, for both content and SEL. This is true for in-person and remote learning.”

**Statement**: “Regardless of ‘requirements’, we recommend that sites and individual teachers set a precedent to *offer* regular synchronous experiences in their (math) classrooms, and set an *expectation* that students do their best to show up to said synchronous opportunities.”
## District Level Math Department PD

### Elementary 2020-2021

**Grades 3-5 Opening Week 2 hours**

- Welcome from Ishmael
- #Mathwithmemn
- TQE/DL Resources

### Number String PD (Aug. & Dec.)

- K-2
- 3-5

### CRI training- date/time TBD

Math Leads - (7 meetings this year)

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### SPPS Elementary Math ‘19-’20 PD Calendar

#### District PD (Elementary):
- Wednesday, August 26 (Solution Tree presenters) [3-5] 8:00 - 11:00 or 1:00 - 4:00 [Opening Week] MATH1902
- Tuesday, August 27 (Solution Tree presenters) [K-2] 12:30 - 3:30 (optional) MATH1901
- Friday, March 6 (Solution Tree presenters) [K-2] 12:30 - 3:30 (optional) MATH1933

#### Lead Meetings

- **Fri., Sept. 13**
- **Fri., Oct. 11**
- **Fri., Dec. 20**
- **Fri., Jan. 31**
- **Fri., Feb. 14**
- **Fri., Mar. 13**
- **Fri., Apr. 17**
- **Fri., May 8**

#### Pathways AoT

**Year 1 Day 1 (3-5)**
- Tues. 11/15 12:30-3:30
- Math Review/Number Talks MATH1908
- 9/9/19 (4:30 - 7:00 PM)
- 12/9/19 (4:30 - 7:00 PM)

**Year 2 Day 1 (K-2)**
- Tues. 10/23 12:30-3:30

**Year 2 Day 2 (K-2)**
- Fri. 1/17 8:30-3:30

### Cohort Meetings:
- **35 participants/day (8:30 - 3:30)**
- All Grade 3-5 teachers choose only one Fall and one Spring date.

#### 3rd Grade

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>5th Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH1911</td>
<td>MATH1912</td>
<td>MATH1913</td>
</tr>
<tr>
<td>Oct. 1</td>
<td>Oct. 3</td>
<td>Oct. 7</td>
</tr>
<tr>
<td>Oct. 16</td>
<td>Oct. 22</td>
<td>Oct. 29</td>
</tr>
<tr>
<td>Oct. 30</td>
<td>Oct. 31</td>
<td>Nov. 7</td>
</tr>
<tr>
<td>Nov. 19</td>
<td>Nov. 13</td>
<td>Nov. 14</td>
</tr>
<tr>
<td>Nov. 26</td>
<td>Nov. 21</td>
<td>Nov. 25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3rd Grade</th>
<th>4th Grade</th>
<th>5th Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH1921</td>
<td>MATH1922</td>
<td>MATH1923</td>
</tr>
<tr>
<td>Jan. 26</td>
<td>Jan. 29</td>
<td>Jan. 30</td>
</tr>
<tr>
<td>Feb. 3</td>
<td>Feb. 4</td>
<td>Feb. 7</td>
</tr>
<tr>
<td>Feb. 11</td>
<td>Feb. 13</td>
<td>Feb. 18</td>
</tr>
<tr>
<td>Feb. 26</td>
<td>Feb. 25</td>
<td>Feb. 27</td>
</tr>
<tr>
<td>March 3</td>
<td>March 5</td>
<td>March 10</td>
</tr>
</tbody>
</table>

#### Data Well Information

- **Gr. 3** MATH1905
- 9/16/19 (4:30 - 7:00 PM)
- 9/23/19 (4:30 - 7:00 PM)
- 9/30/19 (4:30 - 7:00 PM)

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### Misc. PD

- Data Well Information Gr. 3 MATH1905
- Data Well Information Gr. 4 MATH1906
- Data Well Information Gr. 5 MATH1907
- 9/16/19 (4:30 - 7:00 PM)
- 9/23/19 (4:30 - 7:00 PM)
- 9/30/19 (4:30 - 7:00 PM)
District Level Math Department PD

**District PD (Secondary):**
Tuesday, August 27 (Solution Tree presenters)
8:30 - 11:30 and 12:30 - 3:30 Optional continued work [Opening Week]

Friday, March 6 (Solution Tree presenters)
8:30 - 11:30 and 12:30 - 3:30 Optional continued work [Sec. District PD Day]

**Leads Meetings**
(MATH143)
(Fri., Sept. 13) LL only
Fri., Oct. 11
Fri., Nov. 8
Fri., Dec. 20
Fri., Jan. 11
Fri., Feb. 14
Fri., Mar. 13
(Fri., Apr. 17) LL only
Fri., May 8

**Pathways AoT**
Year 1 Day 1
Thurs. 10/31 12:30-3:30

Year 1 Day 2
Wed. 1/15 8:30-3:30

Year 2 Day 1
Tues. 10/29 12:30-3:30

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**Cohort Meetings:** (8:30 - 3:30)

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Dates</th>
<th>Grade</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 6</td>
<td>(MATH1914)</td>
<td>6-8</td>
<td>Thurs., Nov. 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wed., Oct. 23</td>
</tr>
<tr>
<td>Pre-Algebra</td>
<td>(MATH1915)</td>
<td>9-12</td>
<td>Tues., Nov. 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wed., Dec. 25</td>
</tr>
<tr>
<td>Algebra I</td>
<td>(MATH1916)</td>
<td>9-12</td>
<td>Wed., Apr. 15</td>
</tr>
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<td></td>
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<td></td>
<td>Wed., Mar. 25</td>
</tr>
<tr>
<td>Int. Algebra</td>
<td>(MATH1917)</td>
<td>9-12</td>
<td>Wed., Mar. 16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mon., Dec. 16</td>
</tr>
<tr>
<td>Geometry</td>
<td>(MATH1918)</td>
<td>9-12</td>
<td>Tues., Mon. 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wed., Dec. 25</td>
</tr>
<tr>
<td>Algebra II</td>
<td>(MATH1919)</td>
<td>9-12</td>
<td>Wed., Apr. 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wed., Mar. 26</td>
</tr>
</tbody>
</table>

**Cohort Extensions:**
Middle School (MATH1920)
Wed., Sept. 25
High School (MATH1930)
Wed., Oct. 2

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**Number String PD (Aug. & Dec.)**
- Welcome from Ishmael
- #Mathwithmemn
- TQE/DL Resources

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**Changes new to 2019-2020**
- About one cohort per week, spread out over 2 months
- Cohort extension days created to extend work for teachers who have come consistently to past cohorts. While fall cohort days will be designed to bring new attendees up to speed on cohort work of last 2 years.
Why is it important for us to come together?
MLL Supports

Our summer work and moving forward
Supporting our curriculum work

- Participants received PD around MLL supports in mathematics which they then applied to their work with feedback and coaching support.

- Participants received the Zaretta Hammond book *Culturally Responsive Teaching and the Brain* to read prior to our work days.

- Participants received PD utilizing the work from Zaretta Hammond’s book, participated daily in book discussions with their collaborative group and applied their learning to their work with feedback and coaching support.
### MLL Strategies in math lessons

<table>
<thead>
<tr>
<th><strong>Listen</strong></th>
<th><strong>Speak</strong></th>
<th><strong>Read</strong></th>
<th><strong>Write</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>● To the teacher</td>
<td>● Turn and talk</td>
<td>● Directions</td>
<td>● Explanations</td>
</tr>
<tr>
<td>● To each other</td>
<td>● Partner work</td>
<td>● Explanations</td>
<td>● Solutions</td>
</tr>
<tr>
<td>● To video</td>
<td>● Group work</td>
<td>● Solutions</td>
<td>● Turn and talks</td>
</tr>
<tr>
<td>● To music</td>
<td>● Teacher questioning</td>
<td>● Turn and talks</td>
<td>● Questions</td>
</tr>
</tbody>
</table>

They need to do all four of these every day!
# Building Sentence Stems and Frames in a Lesson

## Quarter 4: Unit #11 (3D Measurement): Conceptual Lesson

**Standard:** 5.3.1.2 Recognize and draw a net for a three-dimensional figure.

| Preparing for the Mini-Lesson (within Part 1 of the Math Workshop Model) |
|-------------------------------------------------|-----------------|-------------------------------------------------|
| **TQE Lesson Task:** (Potential of the Task rating is ____)
  | **Learning Goal:** Recognize a 3D shape from a net.  |
  | **Academic Language Objective:**                   |
  | **What tools/materials will you use to support students to engage with the task?** |
  | • Slides                                           |
  | • Print-out of nets                                |

How this lesson supports MLL Learners *(modify as needed based on your students MLL levels)*

**Sentence Stems and Frames**

How this lesson supports Culturally Responsive Instruction *(modify as needed)*

**4 R's of Instruction**

**Universal Support/Differentiation:** *(modify as needed)*

- What alternative structures/modifications might be made available to students to provide linguistic and/or differentiated supports?

Opening Task/Prompt: **Math Talk: NOTICE and WONDER** *(Slides)*
# Quarter 3: Unit 7 (Trigonometry): Conceptual Lesson

**Standard:** 9.3.4.2  
a.) I can determine lengths and areas in right triangles, and figures containing right triangles, using sine, cosine, and tangent.

### TQE Lesson Task: Potential of the Task 

<table>
<thead>
<tr>
<th>TQE Lesson Task</th>
<th>Learning Goal</th>
<th>Materials/Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential of the Task</strong></td>
<td>Students begin to notice right angles in everyday life. Students label sides of right triangles.</td>
<td>What tools/materials will you use to support students to engage with the task?</td>
</tr>
</tbody>
</table>

**Academic Language Objective:** I can use mathematical skills to understand (improve, analyze, learn about) my community.

**Materials/Tools:**  
- Identifying opposite, adjacent and hypotenuse (video)  
- Unit 7 Teacher Slides

### How this lesson supports MLL Learners (modify as needed based on your students MLL levels)

- Lesson uses images, individual, partner, and group work, repeated use of unit vocabulary, sentence stems and frames, journals, note-taking, drawing, flipped classroom homework, opportunities to speak in L1 if necessary, exit ticket  
  
  **Ref.:** Sentence Stems and Frames

### How this lesson supports Culturally Responsive Instruction (modify as needed)

- Unit deals with use of neighborhood space and culminates in student created neighborhood gardens.  
  
  **Ref:** 4 R's of Instruction

### Universal Support/Differentiation: (modify as needed)

- See MLL supports above

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**Tenth Grade Example**
# Language Functions by Levels

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give</td>
<td>Retell</td>
<td>Develop</td>
<td>Analyze</td>
<td>Evaluate</td>
</tr>
<tr>
<td>Ask</td>
<td>Share</td>
<td>Compare</td>
<td>Process</td>
<td>Adjust</td>
</tr>
<tr>
<td>State</td>
<td>Connect</td>
<td>Contrast</td>
<td>Persuade</td>
<td>Apply</td>
</tr>
<tr>
<td>Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can <em>locate</em> points on a coordinate plane.</td>
<td>I can <em>order</em> points on a coordinate plane.</td>
<td>I can <em>compare</em> points on a coordinate plane.</td>
<td>I can <em>differentiate</em> points on a coordinate plane.</td>
<td>I can <em>justify</em> points on a coordinate plane.</td>
</tr>
</tbody>
</table>

**More detailed list:**
[Language Functions by Levels](#)
Culturally Responsive Instruction

Our summer work and moving forward
This is mathematics in America
Higher Order Thinking (Bloom’s Revised Taxonomy)

Student-Centered

Teacher Led

REMEMBER
Who? What?

UNDERSTAND
How?

APPLY
How does it work?

ANALYZE
Why?

EVALUATE
What if?

CREATE
What could you produce?

What can you design?
How would you develop?

How can you innovate?
What can you invent?

What is the effect?
What is the impact?
What is the result?

What is the cause?
What is the reason?

What does it infer?
What does it suggest?

What would happen?
What could happen?

Where? When?
What would a math class like this look like??
Read the following quote:

“In recent years, there’s been a lot of talk about the reasons behind the low performance of many students of color, English learners, and poor students. Rather than examine school policies and teacher practices, some attribute it to a “culture of poverty” or different community values toward education. The reality is that they struggle not because of their race, language, or poverty. They struggle because we don’t offer them sufficient opportunities in the classroom to develop the cognitive skills and habits of mind that would prepare them to take on more advanced academic tasks. That’s the achievement gap in action.”

(Jackson, 2011; Boykin and Noguera, 2011; Hammond, 2015)
Zaretta Hammond

<table>
<thead>
<tr>
<th>The Dependent Learner</th>
<th>The Independent Learner</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Is dependent to the teacher to carry most of the cognitive load of a task always</td>
<td>• Relies on the teacher to carry some of the cognitive load temporarily</td>
</tr>
<tr>
<td>• Is unsure of how to tackle a new task</td>
<td>• Utilizes strategies and processes for tackling a new task</td>
</tr>
<tr>
<td>• Cannot complete a task without scaffolds</td>
<td>• Regularly attempts new tasks without scaffolds</td>
</tr>
<tr>
<td>• Will sit passively and wait if stuck until teacher intervenes</td>
<td>• Has cognitive strategies for getting unstuck</td>
</tr>
<tr>
<td>• Doesn't retain information well or “doesn’t get it”</td>
<td>• Has learned how to retrieve information from long-term memory</td>
</tr>
</tbody>
</table>

**Dependent Learner Characteristics vs. Independent Learner**
America’s Reality.

“The chronic achievement gap in most American schools has created an epidemic of dependent learners unprepared to do the higher order thinking, creative problem solving and analytical reading and writing called for.”
Watch later: Love Them First

love them first
LESSONS FROM LUCY LANEY ELEMENTARY
A Solution.

“Culturally responsive teaching is a powerful tool to help dependent learners develop the cognitive skills for high order thinking and independent learning.”

-Zaretta Hammond
HOW?
1. Blooms (student products)
2. 4 R’s
3. Math Identities
Summer work

Dependent Learners
Remember, Understand and Apply.

Independent Learners
Analyze, Evaluate and Create.
4 R’s

**Relationships**
- Classroom culture is inclusive
- Positive classroom culture
- Includes teacher, students and community

**Realness**
- Students can show up as their authentic selves
- Classroom culture is inclusive

**Relevance**
- Students make connections with what they are learning
- Personalized learning is evident
- Critical pedagogy is evident

**Rigor**
- Curriculum is standards-based
- Personalized learning is evident
- Students are scaffolded to succeed
- Critical pedagogy is evident
Mathematics Identities

1. beliefs about one’s self as a mathematics learner
2. one’s perceptions of how others perceive him as a mathematics learner
3. beliefs about the nature of mathematics
4. engagement in mathematics
5. perception of self as a potential participant in mathematics
Shifting mathematical identities

✔ Model positive discourse.
✔ Get to know your students’ identities.
✔ Create opportunities for positive math identities to be developed/fostered
✔ Ensure opportunities for all students to be successful.
✔ Engage all students.

Sara Van Der Werf
An Example: #MathwithmeMN
An Example: #MathwithmeMN

Phase 1

Use the next 5 minutes to find any objects in your home / around you to recreate this pattern… Post it here (Padlet)
An Example: #MathwithmeMN - Phase 2

STARTS WITH 3
An Example: #MathwithmeMN - Phase 2

We are going to use a class Jamboard. Click on the links by last name to follow directions for this task.

- Last names A-E
- Last names F-J
- Last names K-O
- Last names P-T
- Last names U-Z
Take 5 minutes to stand and stretch
Tasks, Questions and Evidence

What to look for when observing a TQE lesson
Explore the TQE Resources

Take some time to explore the materials created this summer. Look at:

- New landing page for the Scope & Sequence
- New Unit design
- Revised lesson plan template
- Examples of MLL supports and CRI
- Supporting slides for each unit
- How conceptual and linking tasks use Layer’s of Facilitation- procedural tasks use Gradual Release
Making Sense of the TQE Process

- Select appropriate Tasks to support identified learning goals.
- Facilitate productive Questioning during instruction to engage students in the Mathematical Practices and Processes.
- Collect and use student Evidence in the formative assessment process during instruction.
Tasks

[There is] no decision teachers make that has a greater impact on students’ opportunities to learn and on their perception about what mathematics is than the selection or creation of tasks with which the teacher engages students in studying mathematics.

- Glenda Lappan and Diane Briars

Being aware of both the type of thinking a task can elicit and the types of access a task can give to all students can support you to align tasks with Learning Goals, and to ensure that students receive opportunities for thinking and reasoning.

Finally, research has also shown that the level of the task sets the ceiling for the mathematical thinking, reasoning, and discussion that occurs throughout a lesson, and if a task does not request a representation, explanation, or justification students typically do not produce or provide these things during a lesson. (Boston & Wilhelm, 2015)
The potential of a task

| Preparing for the Mini-Lesson  
| (Part 1 of the Math Workshop Model) |
|---|---|---|
| TQE Lesson Task: 1  
Potential of the Task rating:  
Problem 1:  
28 + 46 |
| Learning Goal:  
Modeling multi-digit addition with base ten blocks |
| Materials/Tools:  
Base-10 blocks  
Place value mat  
Slides |
| Problem 2:  
47+ 39 |
| Academic Language Objective: |

Take a few minutes to read through the IQA Potential of a Task Rubric we put in the chat box.
Putting it into practice

● Use the rubric to determine what level each problem is

● Type your response in the chat box
  I.e. A=4, B=1, etc
Consider these problems...

A
Divide:
26 ÷ 4 → _____ R _____
17 ÷ 5 → _____ R _____
43 ÷ 6 → _____ R _____

B
Write a word problem for 26 divided by 4 that results in an answer of 7. Do not use the words around, estimate, or about.

C
Write word problems for 26 divided by 4 where:
- The answer would need to be 7.
- The answer would need to be 6.
- You would need the exact answer.

How are the three situations the same and how are they different? How is it possible to get a different answer to the same division problem?

D
For the following problems, underline the divisor, circle the dividend, put a square around the quotient, and put a triangle around the remainder.

\[ \begin{array}{c}
4 \overline{)26} \\
6 R 2 \\
\end{array} \]
Implementation of the Task Rubric

Read through the Instructional Quality Assessment

Implementation of the Task rubric
Asanya had two and one-thirds candy bars. She promised her brother that she would give him half the candy bar. How much would she have left after she gives her brother the amount she promised?

Use the Implementation of the Task rubric to evaluate this lesson.
In the chat add:
This is rated a ___ because...
Now let’s consider this task...

Watch this video of a virtual class math talk. Use the Implementation of a Task rubric to rate the implementation. In the chat add:

I rated this a _____ because...
Reflection

How would you compare/contrast the way these two teachers implemented the task?
How did the teacher’s implementation of the task impact the potential of the task?
6 Spheres of Influence

...that Administrators have in Mathematics Teaching and Learning
Survey Feedback

Please include what resources or additional information you will need.
thank you