Louisiana Department of Education
Mentor Teacher Training

Module 2:
Understanding Instructional Shifts in Mathematics

Secondary Math Cohort
June, 2019

Facilitated by Learning Forward

Mentor Teacher Training

Mentor Training Course Goals

Mentors will:

- Build strong relationships with mentees.
- Diagnose and prioritize mentee's strengths and areas for growth.
- Design and implement a coaching support plan to develop mentee knowledge and skills.
- Assess and deepen mentor content knowledge and content-specific pedagogy.

Module 2 Outcomes:

- Describe key shifts in mathematics standards and instruction (rigor, focus, and coherence).
- Identify how to support mentees in using the key shifts to guide decisions about teaching and learning mathematics.
- Conduct classroom observations to collect data on student and teacher actions.
- Analyze data to identify needs for improving student learning and mentee instructional practice.

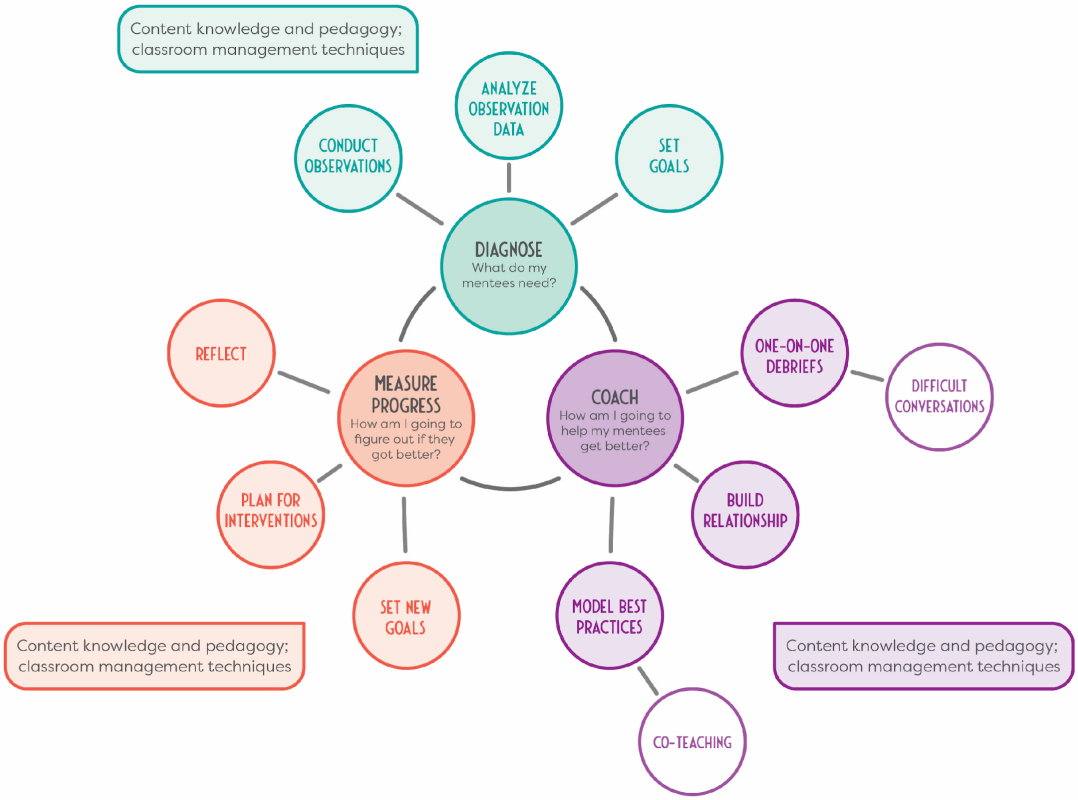
Module 2 Agenda:

- Welcome/Norms/Overview
- Key Shifts in Mathematics
    - Rigor
    - Focus
    - Coherence
- Lunch
- Conduct Observations
- Analyze Observation Data
- Connection to Assessments

Mutual Commitments:

Make the learning meaningful
Engage mentally and physically
Notice opportunities to support the learning of others
Take responsibility of own learning
Own the outcomes
Respect the learning environment including use of technology

The Mentoring Cycle



National School Reform Faculty
Harmony Education Center
www.nsrfharmony.org

Text Rendering Experience

Developed in the field by educators affiliated with NSRF.

Purpose

To collaboratively construct meaning, clarify, and expand our thinking about a text or document.

Roles

A facilitator to guide the process.
A scribe to track the phrases and words that are shared.

Set Up

Take a few moments to review the document and mark the sentence, the phrase, and the word that you think is particularly important for our work.

Steps

1. First Round: Each person shares a *sentence* from the document that he/she thinks/feels is particularly significant.

2. Second Round: Each person shares a *phrase* that he/she thinks/feels is particularly significant. The scribe records each phrase.

3. Third Round: Each person shares the *word* that he/she thinks/feels is particularly significant. The scribe records each word.

4. The group discusses what they heard and what it says about the document.

5. The group shares the words that emerged and any new insights about the document.

6. The group debriefs the text rendering process.

Protocols are most powerful and effective when used within an ongoing professional learning community such as a Critical Friends Group® and facilitated by a skilled coach. To learn more about professional learning communities and seminars for new or experienced coaches, please visit the National School Reform Faculty website at www.nsrfharmony.org.

Key Shifts in Mathematics

Introduction

The Common Core State Standards for Mathematics build on the best of existing standards and reflect the skills and knowledge students will need to succeed in college, career, and life. Understanding how the standards differ from previous standards—and the necessary shifts they call for—is essential to implementing them.

The following are the key shifts called for by the Common Core:

1. Greater <u>focus</u> on fewer topics

   The Common Core calls for greater focus in mathematics. Rather than racing to cover many topics in a mile-wide, inch-deep curriculum, the standards ask math teachers to significantly narrow and deepen the way time and energy are spent in the classroom. This means focusing deeply on the major work of each grade as follows:

   - In grades K–2: Concepts, skills, and problem solving related to addition and subtraction
   - In grades 3–5: Concepts, skills, and problem solving related to multiplication and division of whole numbers and fractions
   - In grade 6: Ratios and proportional relationships, and early algebraic expressions and equations
   - In grade 7: Ratios and proportional relationships, and arithmetic of rational numbers
   - In grade 8: Linear algebra and linear functions

   This focus will help students gain strong foundations, including a solid understanding of concepts, a high degree of procedural skill and fluency, and the ability to apply the math they know to solve problems inside and outside the classroom.

2. <u>Coherence</u>: Linking topics and thinking across grades

   Mathematics is not a list of disconnected topics, tricks, or mnemonics; it is a coherent body of knowledge made up of interconnected concepts. Therefore, the standards are designed around coherent progressions from grade to grade. Learning is carefully connected across grades so that students can build new understanding onto foundations built in previous years. For example, in 4th grade, students must "apply and extend previous understandings of multiplication to multiply a fraction by a whole number" (Standard 4.NF.4). This extends to 5th grade, when students are expected to build on that skill to "apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction" (Standard 5.NF.4). Each standard is not a new event, but an extension of previous learning.

   Coherence is also built into the standards in how they reinforce a major topic in a grade by utilizing supporting, complementary topics. For example, instead of presenting the topic of data displays as an

end in itself, the topic is used to support grade-level word problems in which students apply mathematical skills to solve problems.

3. Rigor: Pursue conceptual understanding, procedural skills and fluency, and application with equal intensity.

   Rigor refers to deep, authentic command of mathematical concepts, not making math harder or introducing topics at earlier grades. To help students meet the standards, educators will need to pursue, with equal intensity, three aspects of rigor in the major work of each grade: conceptual understanding, procedural skills and fluency, and application.

   Conceptual understanding: The standards call for conceptual understanding of key concepts, such as place value and ratios. Students must be able to access concepts from a number of perspectives in order to see math as more than a set of mnemonics or discrete procedures.

   Procedural skills and fluency: The standards call for speed and accuracy in calculation. Students must practice core functions, such as single-digit multiplication, in order to have access to more complex concepts and procedures. Fluency must be addressed in the classroom or through supporting materials, as some students might require more practice than others.

   Application: The standards call for students to use math in situations that require mathematical knowledge. Correctly applying mathematical knowledge depends on students having a solid conceptual understanding and procedural fluency.

Common Core State Standards for Mathematics (CCSSM). (2010, June). Retrieved from Common Core State Standards: http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

Looking for Evidence of Student Engagement in the Key Shifts

Focus	Evidence
☐ The learning goal(s) of the lesson supports grade level standard(s).	
Coherence	
☐ The lesson intentionally relates new concepts to students' prior skills and knowledge. ☐ Students set the foundation for future learning. ☐ Students access prior learning from major work in the grade in order to support new learning.	
Rigor	
Conceptual Understanding ☐ Students access concepts and ideas from a variety of perspectives. ☐ Students explain mathematical ideas behind a particular concept in a variety of ways. ☐ Students use examples and counterexamples to make and support conjectures applied to one problem to multiple situations. ☐ Students create and use a variety of models to analyze relationships. ☐ Students make use of patterns and structure to compose and decompose numbers, shapes, expressions, and equations. **Procedural Skills and Fluency** ☐ Students select tools (e.g. physical objects, manipulatives, drawings, diagrams, algorithms, or strategies) that are relevant and useful for the task or problem. ☐ Students communicate thinking using appropriate vocabulary, symbols and/or units in precise and accurate ways. ☐ Students look for patterns, generalizations, and shortcuts. ☐ Students are flexible in their use of procedures and skills to solve problems. **Application** ☐ Students decontextualize and contextualize quantities in problem situations. ☐ Students plan and choose a solution pathway when applying their mathematical knowledge to different situations.	

Note: To help educators look for evidence of grade-level-appropriate student engagement in mathematical tasks, these narrative descriptors are adapted from Illustrative Mathematics. (2014, February 12). *Standards for Mathematical Practice: Commentary and Elaborations for K–5 and 6-8*. Tucson, AZ. Available at http://commoncoretools.me/2014/02/12/k-5-elaborations-of-the-practice-standards

Let's Reflect:

1. Identify one connection between the sample EngageNY problems and the components of rigor.

2. What does it look like when we ask students to work on procedural skill and fluency versus conceptual understanding or application?

3. How will this new learning impact your role as a mentor?

4. How could knowing the related standard(s) affect teaching and learning in your classroom?

5. How might you approach teaching the standards differently knowing that they are supporting the major work of the grades?

6. How will you use this learning in your mentor role?

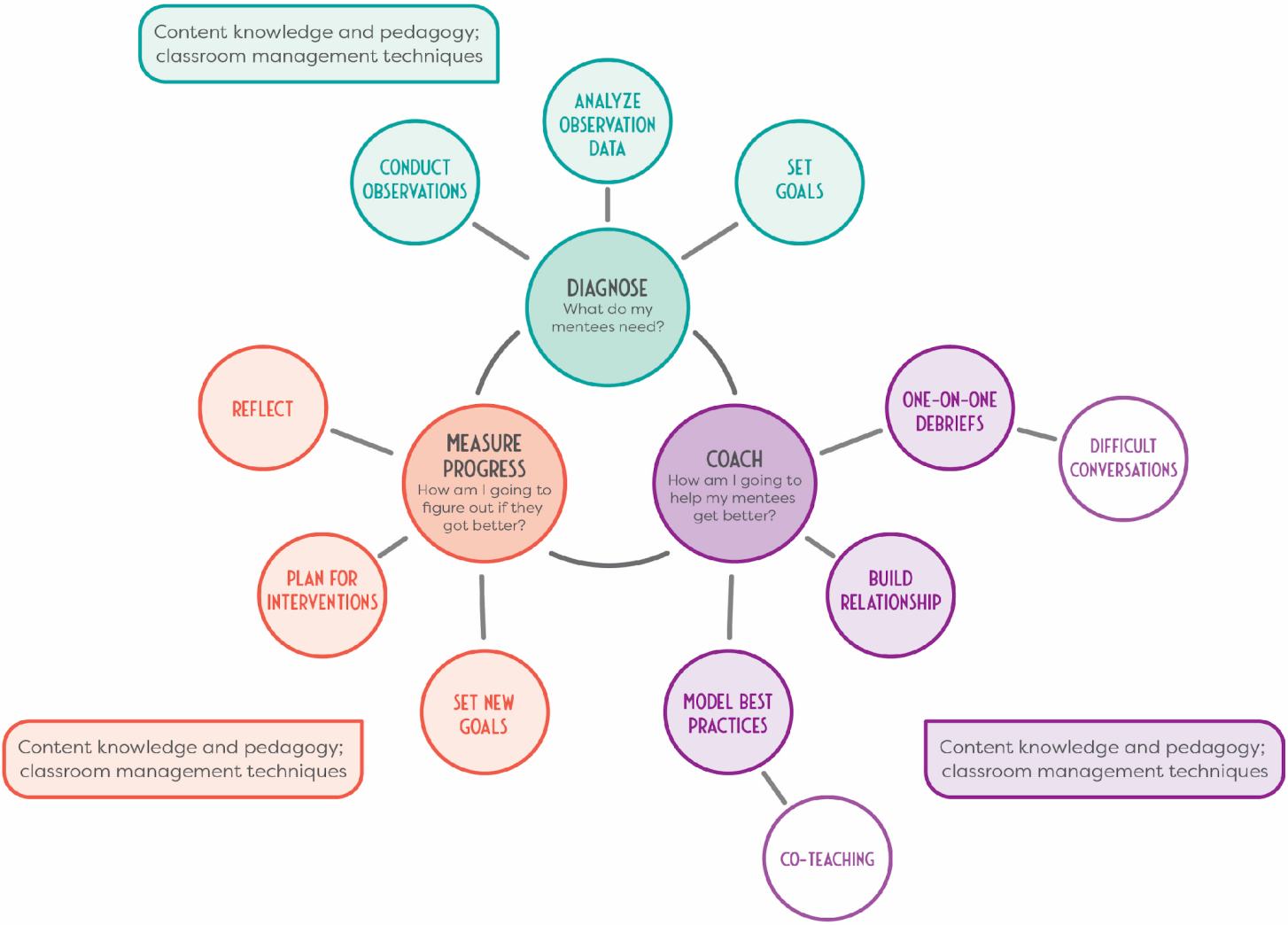
One-Minute Paper:

How do you see yourself using the math content knowledge you built this morning as a mentor?

Module 2 Afternoon Outcomes

- Conduct classroom observations to collect data on student and teacher actions.
- Analyze data to identify needs for improving student learning and mentee instructional practice.

The Mentoring Cycle



Conduct Observations: 3 Key Components

- Confirm observation details
- Observe students and teacher in action
- Record notes using “look-fors”

Confirm Observation Details

Key Components to Discuss	Guiding Question(s)	Notes
Observation day and time	• Where and when will the observation take place?	
Observation/ classroom logistics	• How long will the observation last? • Where is the best place for the mentor to sit? • What kinds of interaction between mentor and students are okay? • Is there anything the mentor needs to know about the classroom and/or students?	
Instructional goal of lesson	• What is the instructional goal of the lesson? • What standard(s) does it align to? • Why does the mentee want students to meet this goal?	
Focus of observation	• What is the focus of the observation? (E.g., classroom management, questioning, student discourse) • What does the mentee hope to gain as a result of being observed?	
Student work and data to collect	• What will students be working on during the lesson? • What work can be collected and discussed during the debrief? • What, if any, data will be generated in the lesson?	
Confidentiality	• What needs to be kept confidential between the mentor and mentee to enable authentic growth?	
Debrief conversation day and time	• Where and when will the debrief conversation take place?	

Observe Students and Teacher in Action

Do	Don't
Stay close to the action	Hang back and miss what's happening
Watch carefully and ask questions of students while they're working	Jump in to "fix" this one lesson
Look specifically for evidence of the focus of your observation and when it occurred during the lesson (e.g. rigor)	Take unfocused notes on a range of topics
Script exactly what you hear from teacher and students	Only write down things that fit a preconceived idea or jump to judgements

Classroom Observation Tool

Focus of Observation:		
"Look-Fors" **What does strong teaching for the focus area look like?** *(observer complete prior to observation)*	**Teacher Behaviors**	**Student Behaviors**

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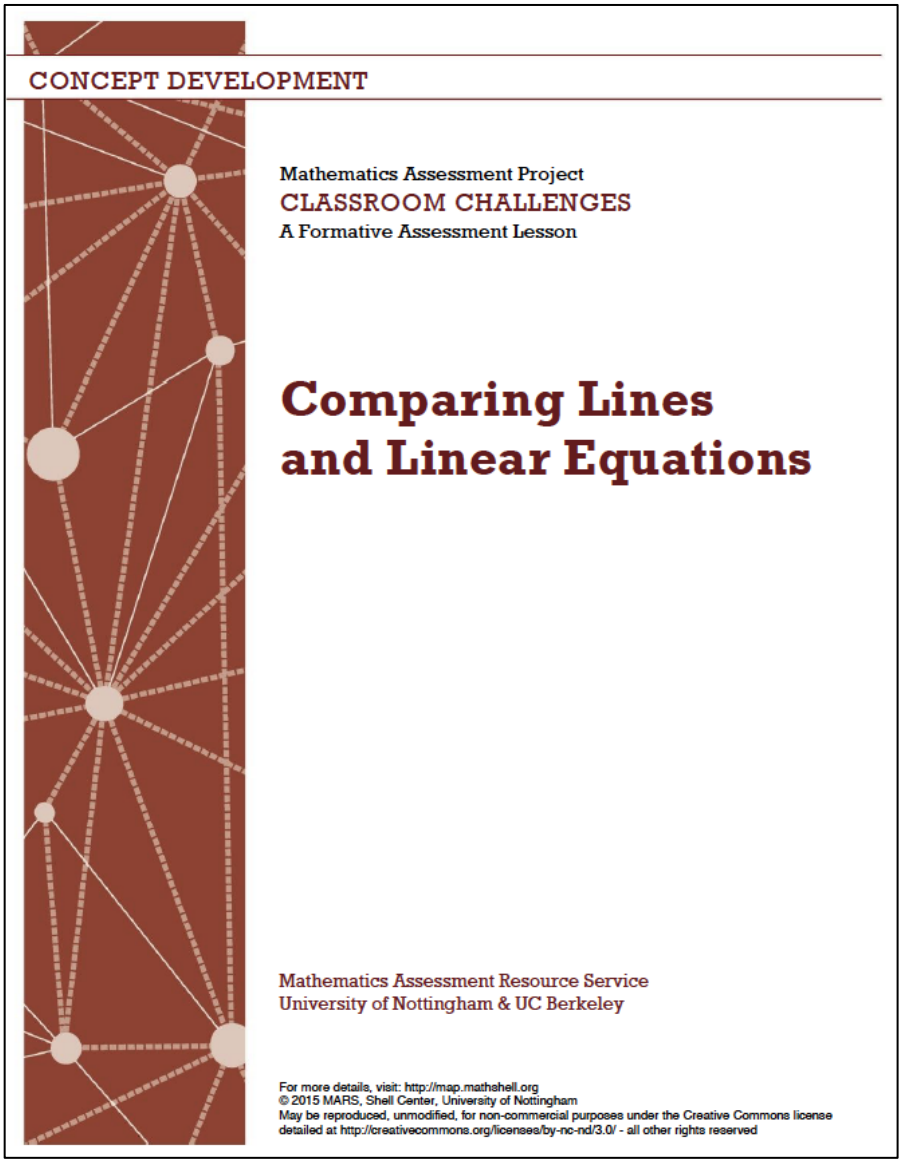
Focus of Observation:		
"Look-Fors" **What does strong teaching for the focus area look like?** *(observer complete prior to observation)*	**Teacher Behaviors**	**Student Behaviors**

Review the lesson plan that addresses the same standard in the video to gain some background about the lesson you are observing. (This is a separate handout.)



https://www.map.mathshell.org/lessons.php?unit=8230&collection=8

Key Takeaway:

Conducting observations in classrooms allows the mentor to collect non-judgemental data on student and teacher actions.

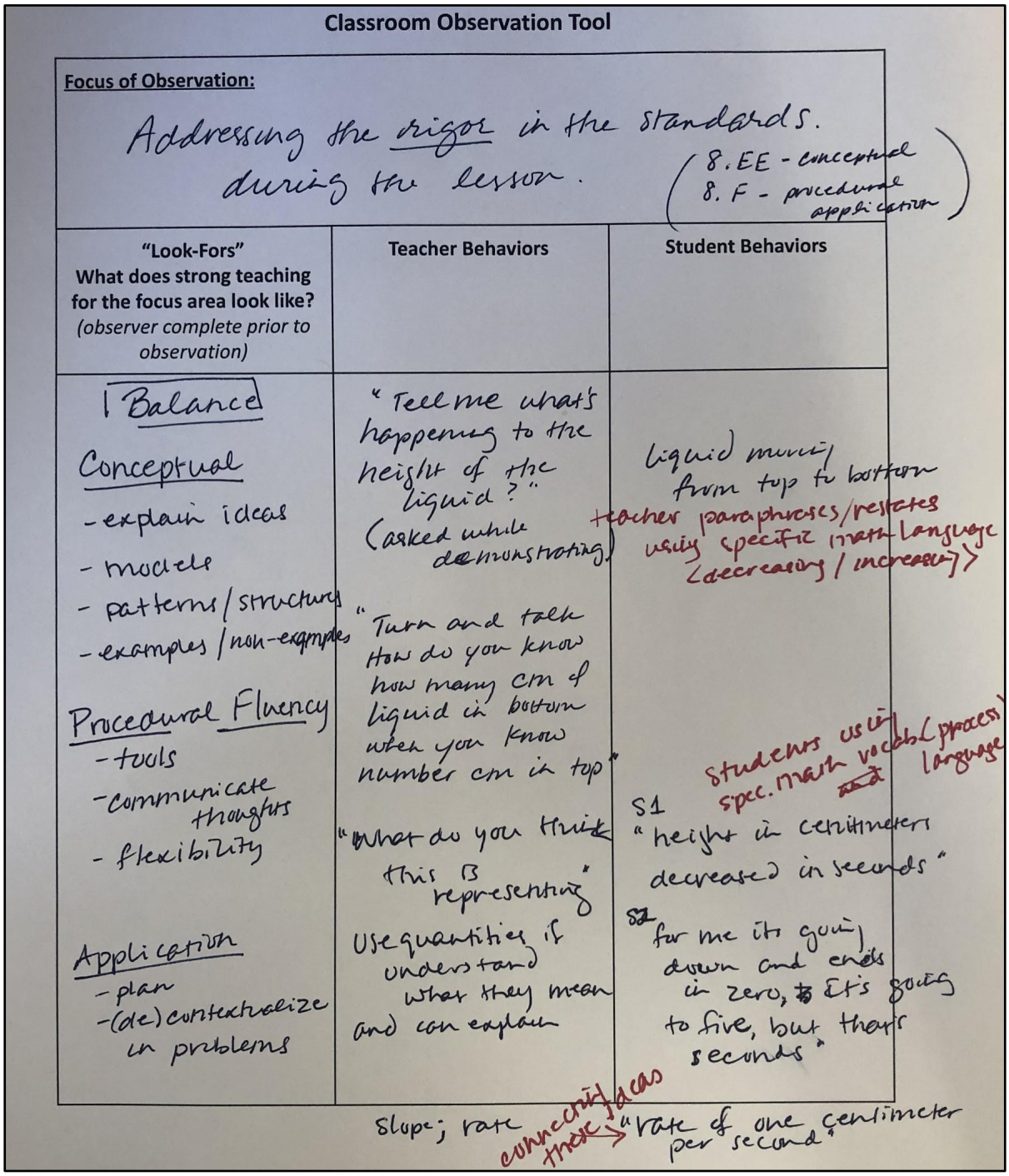
Analyze Observation Data: 3 Key Components

- Analyze observation notes
- Recognize strengths and areas for growth
- Prioritize

Analyze Observation Notes

- Keep the focus of the observation in mind
- Look for evidence or lack of evidence of the focus
- Highlight and make notes in another color with that lens

Sample Analyzed Notes



Classroom Observation Tool

Focus of Observation:

Addressing the rigor in the standards during the lesson.

(8.EE - conceptual
8.F - procedure application)

"Look-Fors" What does strong teaching for the focus area look like? *(observer complete prior to observation)*	Teacher Behaviors	Student Behaviors
Balance Conceptual - explain ideas - models - patterns / structure - examples / non-examples Procedural Fluency - tools - communicate thoughts - flexibility Application - plan - (de) contextualize in problems	"Tell me what's happening to the height of the liquid?" (asked while demonstrating) "Turn and talk how do you know how many cm of liquid in bottom when you know number cm in top" "What do you think this is representing" Use quantities if understand what they mean and can explain	liquid moving from top to bottom teacher paraphrases/restates using specific math language (decreasing / increasing) students use spec. math vocab (process language) S1 "height in centimeters decreased in seconds" S2 for me it's going down and ends in zero, & it's going to five, but their seconds" slope; rate connect ideas these → "rate of one centimeter per second"

What did this mentor notice when they analyzed their notes?

How might this help them prepare to support their mentee?

Analyze Observation Data

Strengths: What was effective about the lesson in regards to the focus area? In which "look fors" did the observee excel? What specific actions did the observee take that enabled them to be successful in the focus area? What specifically were the students able to do as a result of those actions?	**Areas for Growth:** What was ineffective about the lesson in regards to the focus area? Which "look fors" is the observee trying and on the verge of doing? Which "look fors" is the observee ready to try next? Where are there areas of missed opportunity?	**Prioritize One Area for Growth:** In your opinion, which area for growth could have the biggest impact on the observee and their students? What might you recommend the observee change or modify in their focus area based on your observation? What big takeaway do you hope the observee gains as a result of the debrief conversation?
1.	**1.**	
2.	**2.**	
3.	**3.**	

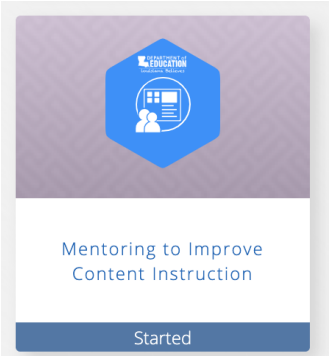
Connection to Mentor Assessments

https://my.bloomboard.com/home

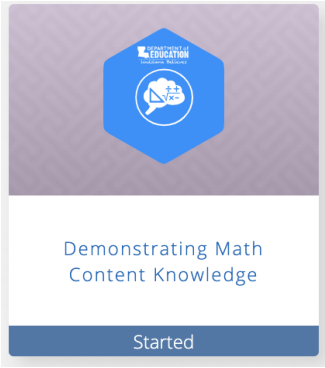
Explore these two assessments and see what additional work you see needing in order to accomplish the tasks.

- Think about what you already feel prepared to complete come the start of the school year.
- Start to make a plan for completing these assessments.
- When do you see the best time will be to complete these assessments during the school year?

Mentoring to Improve Content Instruction

Demonstrating Math Content Knowledge

Key Takeaway:

Analyzing observation data helps the mentor identify areas of strength and the greatest area for growth so they can prepare to support their mentee in growing their practice.

Exit Card:
1. Before I thought… **and now I think….**
2. The most useful thing from today for my own teaching is…
3. The most important from today for me to remember about working with my mentee is…

****Please leave this on your table or hand to a facilitator****

Please complete the Module 1-2 Survey at the following link:

https://bit.ly/2wnqdiC