Louisiana Department of Education
Mentor Teacher Training

Module 4:
Key Shifts in Mathematics and Reflection Conversations

Elementary Cohorts

Facilitated by Learning Forward

Module 4 Outcomes

- Describe rigor, focus, and coherence in the mathematics standards and how these key shifts guide decisions about teaching and learning.
- Use mathematics curriculum resources that clarify the major work of each grade-level/course.
- Acquire tools for gathering data from classroom observations of teaching and student learning.
- Plan and facilitate reflection conversations using data gathered in classroom observations.

Module 4 Agenda

8:30-12:00

- Key shifts in mathematics standards and instruction
- Mathematics curricular resources

12:45-4:00

- Reflection conversations protocols
- Planning reflection conversations
- Application practice

Agreements

- **M**ake the learning meaningful
- **E**ngage mentally and physically
- **N**otice opportunities to support the learning of others
- **T**ake responsibility for your own learning
- **O**wn the outcomes
- **R**espect the learning environment including personal technology

Reflecting on Module 3

- What ideas stuck with me from Module 3?
- What am I wondering about now?

MATHEMATICS CONTENT MODULES

Module 1: Setting the foundation for implementing the curriculum

Session 1: Rigor of the LSSM

Grades K-5

"Ultimately, college and career readiness demands students know more than just content, but demonstrate that they know how to learn and build upon that content to solve problems. They must develop versatile communication skills, work collaboratively and work competitively in a school or work environment."

(Office of the State Superintendent of Education, n.d.)

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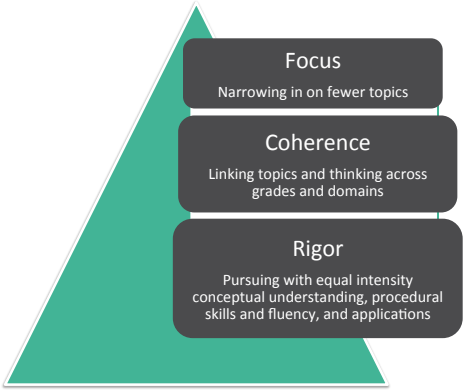
P-00.3

Key shifts of the LSSM

Save the last word for ME



Math Content Module 1, Session 1
Grades K-5
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Looking at the content

Gr K-5 Math Task – Standard Sort

Task	Standard

With your group:

- Match the task to the grade-level/course standard.
- Create a poster as shown.
- Be prepared to justify your reasoning.

Math Content Module 1, Session 1
Grades K-5
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P-00.4

Key shifts

Rigor

Pursuing with equal intensity conceptual understanding, procedural skills and fluency, and applications

Math Content Module 1, Session 1
Grades K-5

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Identifying the components of rigor

Gr K-5 Math Task – Standard Sort

Task	Standard	Component of Rigor
		Conceptual understanding because...
		_____ because...
		_____ because...
		_____ because...
		_____ because...

On your poster:

- Identify the component of rigor that is evident in the task.
- Justify your reasoning.
- Choose a new reporter to be prepared to share out for your group.

Math Content Module 1, Session 1
Grades K-5

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P-00.5

What skills do employers value most?

What implications does this have on planning and instruction?

How do the implications connect to the key shifts of the LSSM?

Attention
- Ability to manage time and prioritize
- Follow-through

Curiosity & Commitment
- Willingness to learn after they graduate college
- Problem solving

Grit & Agility
- Ability to overcome setbacks
- Changes directions quickly and effortlessly
- Goals-driven

Humility
- Ability to ask for help when in need and admit what they don't know
- Team player mentality

Math Content Module 1, Session 1
Grades K–5

(Beaton, 2017)

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Session 1 reflection

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

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

Math Content Module 1, Session 1
Grades K–5

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P-00.6

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

Special permission has been received to reproduce this protocol. The NSRF offers more than 300 protocols and activities, plus coaches' and administrators' trainings to improve teaching practice and student achievement. See http://www.nsrfharmony.org or call 812-330-2702 for details.

Save the Last Word for ME

Developed by Patricia Averette.

Purpose
To clarify and deepen our thinking about articles we read.

Roles
Timekeeper/facilitator, who both participates and keeps the process moving.
The process is designed to build on each other's thinking, and not to enter into a dialogue.
Participants may decide to have an open dialogue about the text at the end of the 30 minutes.
Timing is important; each round should last approximately 7 minutes.

Total Time
approximately 30 minutes.

The Protocol
1. Create a group of 4 participants. Choose a timekeeper (who also participates) who has a watch.

2. Each participant silently identifies what s/he considers to be (for him or her) the most significant idea addressed in the article, and highlights that passage.

3. When the group is ready, a volunteer member identifies the part of the article that s/he found to be most significant and reads it out loud to the group. This person (the *presenter*) says nothing about why s/he chose that particular passage.

4. The group should pause for a moment to consider the passage before moving to the next step.

5. The other 3 participants each have 1 minute to respond to the passage — saying what it makes them think about, what questions it raises for them, etc.

6. The first participant then has 3 minutes to state why s/he chose that part of the article and to respond to — or build on — what s/he heard from his/her colleagues.

7. The same pattern is followed until all four members of the group have had a chance to be the presenter and to have "the last word."

8. Optional open dialogue about the text and the ideas and questions raised during the first part of the protocol.

9. Debrief the experience. How was this a useful way to explore the ideas in the text and to explore your own thinking?

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.

CL-03.1

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 focus 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. Coherence: 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

MATHEMATICS CONTENT MODULES

Module 1: Setting the foundation for implementing the curriculum

Session 2: Focus and coherence of the LSSM

Grades K-5

Focus and coherence of the LSSM

The Louisiana Student Standards for Mathematics are structured around these essential instructional shifts:

Shift 1: Focus

"…focus deeply on only the concepts that are prioritized in the standards…"

Shift 2: Coherence

"…teachers carefully connect the learning within and across grades so that…students can build new understanding onto foundations built in previous years."

Math Content Module 1, Session 2
Grades K-5

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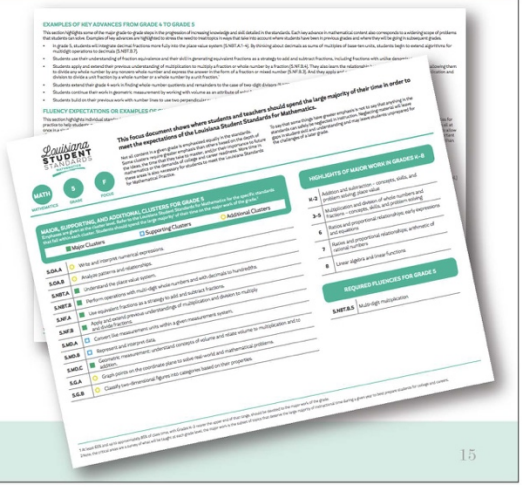
P-00.7

Focus on the major work of the grade

Take a few minutes to familiarize yourself with the Focus Documents.

- How would you summarize the *major work* of your grade?
- Is there anything that you thought should be a part of your grade's major work that is not?
- How do the supporting and additional clusters support the major work in your grade?



Math Content Module 1, Session 2
Grades K-5

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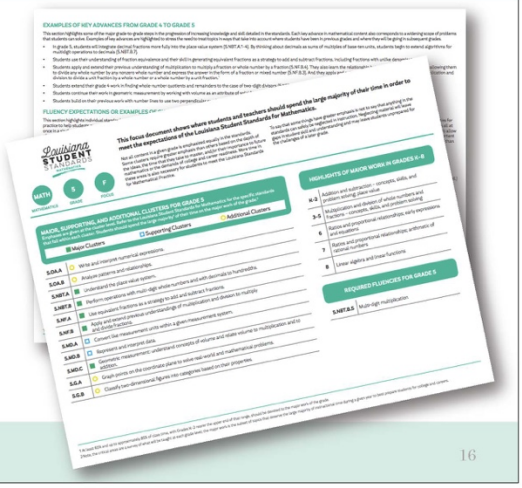
Focus on the major work of the grade

Take a few minutes to familiarize yourself with the Focus Documents.

- What additional information can be found on this document and why is it important?



Math Content Module 1, Session 2
Grades K-5

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P-00.8

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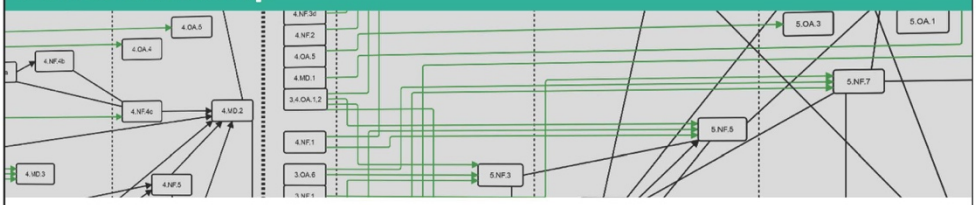
https://achievethecore.org/page/2801/learn-more-about-the-coherence-map

Coherence Map



- Build student understanding by linking together concepts within and across grades.
- Identify gaps in a student's knowledge by tracing a standard back through its logical pre-requisites.
- Visualize and understand how supporting standards relate to the major work of the grade.

Math Content Module 1, Session 2
Grades K-5

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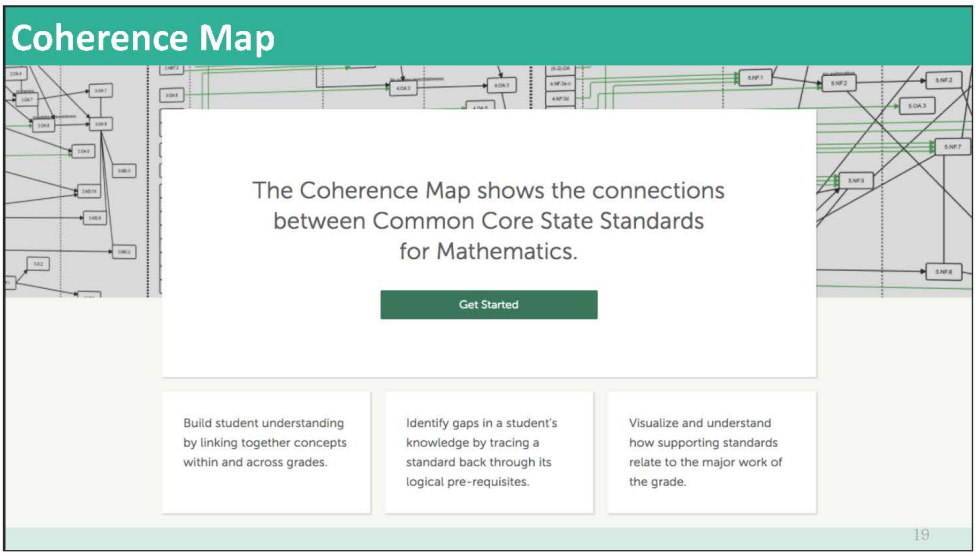
P-00.9


Coherence Map
The Coherence Map shows the connections between Common Core State Standards for Mathematics.
Get Started
Build student understanding by linking together concepts within and across grades.
Identify gaps in a student's knowledge by tracing a standard back through its logical pre-requisites.
Visualize and understand how supporting standards relate to the major work of the grade.
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Coherence Map
Kindergarten
1st Grade
2nd Grade
3rd Grade
4th Grade
5th Grade
6th Grade
7th Grade
8th Grade
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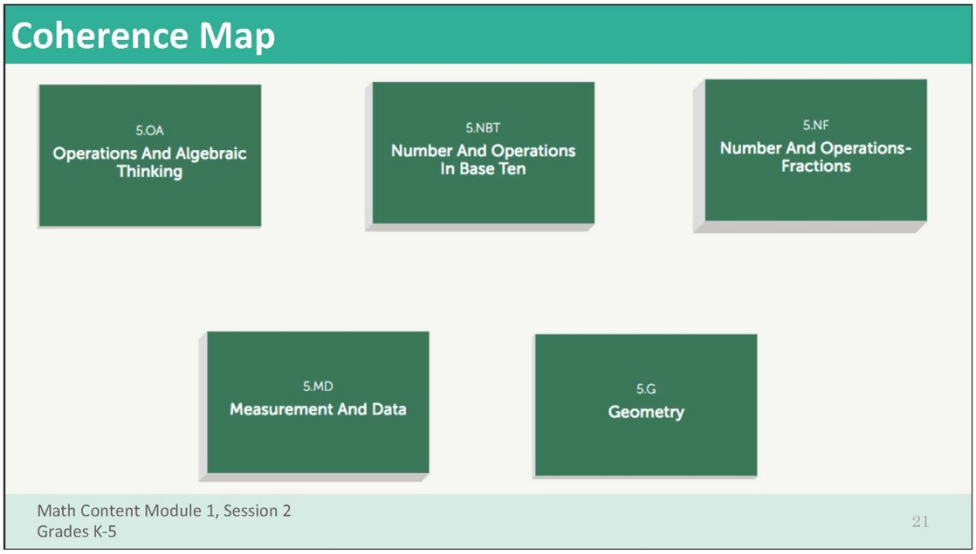
P-00.10


Coherence Map
5.OA
Operations And Algebraic Thinking
5.NBT
Number And Operations In Base Ten
5.NF
Number And Operations- Fractions
5.MD
Measurement And Data
5.G
Geometry
Math Content Module 1, Session 2
Grades K-5
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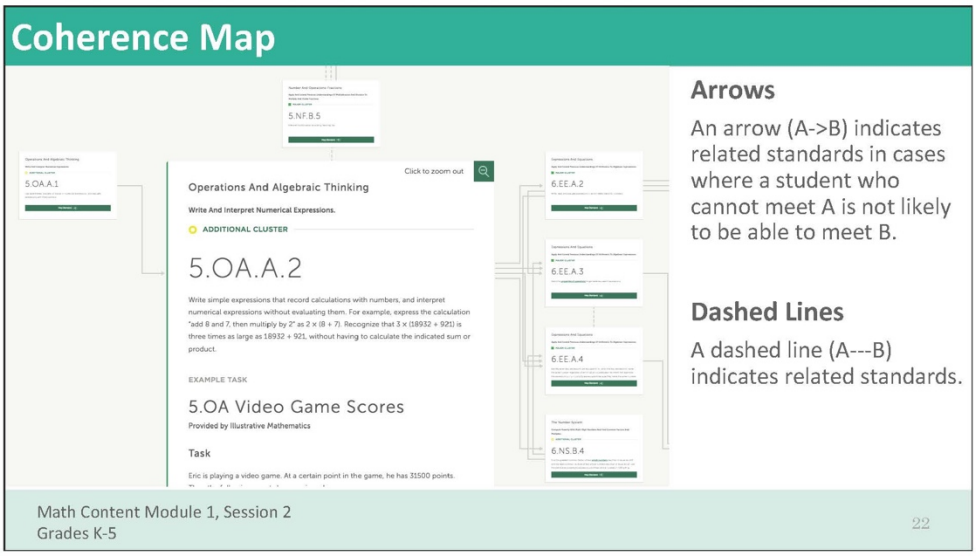
Coherence Map
Click to zoom out
Operations And Algebraic Thinking
Write And Interpret Numerical Expressions.
ADDITIONAL CLUSTER
5.OA.A.2
EXAMPLE TASK
5.OA Video Game Scores
Provided by Illustrative Mathematics
Task
Arrows
An arrow (A->B) indicates related standards in cases where a student who cannot meet A is not likely to be able to meet B.
Dashed Lines
A dashed line (A---B) indicates related standards.
Math Content Module 1, Session 2
Grades K-5
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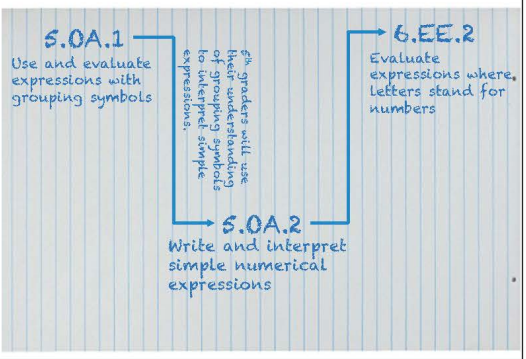
P-00.11

Coherence Map

Take a few minutes to familiarize yourself with the Coherence Map.

On your chart paper:

1. Write your grade-level standard code in the center.
2. Summarize the standard.
3. Identify at least 3 related standards and summarize them.
4. Describe how the standards are related.



Math Content Module 1, Session 2
Grades K-5

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Session 2 reflection

Points to ponder

- How could knowing the related standards affect teaching and learning in your classroom?
- How might you approach teaching the standards differently knowing that they are supporting a major work, instead of being a separate, discrete topic?

Math Content Module 1, Session 2
Grades K-5

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P-00.12

Louisiana Remediation Guides

DEPARTMENT of EDUCATION
Louisiana Believes

Louisiana STUDENT STANDARDS MATHEMATICS

5th Grade Remediation Guide

Focused remediation helps target the skills students need to more quickly access and practice on-grade level content. This chart is a reference guide for teachers to help them more quickly identify the specific remedial standards necessary for every Grade 5 math standard. Students should spend the large majority of their time on the major work of the grade (■). Supporting work (■) and, where appropriate, additional work (■) can engage students in the major work of the grade.

5th Grade Standard	Previous Grade(s) Standards	5th Grade Standards Taught in Advance	5th Grade Standards Taught Concurrently
5.OA.A.1 Use parentheses or brackets in numerical expressions, and evaluate expressions with these symbols.			
5.OA.A.2 Write simple expressions that record calculations with whole numbers, fractions and decimals, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18,932 + 9.21) is three times as large as 18,932 + 9.21, without having to calculate the indicated sum or product.*		5.OA.A.1 Use parentheses or brackets in numerical expressions, and evaluate expressions with these symbols.	5.NF.B.5 Interpret multiplication as scaling (resizing). a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case). c. Explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. d. Relating the principle of fraction

MATHEMATICS CONTENT MODULES

Module 1: Setting the foundation for implementing the curriculum

Session 3: Seeing the key shifts in action

Grades K-5

P-00.13

Reflection Conversation

Guiding questions:

- What is a reflection conversation?
- When do mentors have reflection conversations with residents?
- How do mentors apply the mentor stances in reflection conversations?
- How do mentors prepare for reflection conversations?
- What prompts or questions do mentors use in reflection conversations?
- What can I learn about reflection conversations from observing one modeled for me?
- What can I learn about reflection conversations from practicing one?

The overarching purpose of reflection conversations is to promote a resident teacher's professional confidence, competence, and efficacy. A reflection conversation can occur after demonstration teaching, co-teaching, or observations. After demonstration teaching, the mentor and resident reflect on the mentor's teaching practices and their effect on student learning. After a co-teaching lesson, the mentor and resident together analyze the effect of their co-teaching behaviors on student learning. After the mentor observes the resident teacher, they meet to reflect on how the resident teacher's behaviors influenced student learning.

In a reflection conversation, a mentor's goal is to facilitate a resident teacher's analysis of the instructional practices and decisions and their effect on student learning. A mentor also strives to deepen a resident teacher's awareness of how his or her beliefs, assumptions, and aspirations influence his or her practice. Sometimes reflection conversations include one or more mentor stances to develop a resident teacher's professional practice.

Consult	**Collaborate**	**Mediate**
Mentor directs the reflection conversation by describing what he or she observed and how it affected student learning.	Mentor shares responsibility for the reflection conversation by engaging the resident in jointly identifying the teaching practices and their effect on student learning.	The mentor facilitates the resident's self-analysis of his or her teaching practices and their effect on student learning.

Mentoring cycle
for demonstration teaching, co-teaching, and observing and reflecting

Planning conversation

- Clarify student and teacher learning goals
- Describe teaching strategies
- Determine assessment measures and techniques
- Clarify mentor's role

Teaching (Observation)

- Gather data about teaching practices and student learning, work, and behaviors

Reflection Conversation Part 1

- *Analyze*
  - Review/analyze data about teaching and student learning collected
  - Compare what actually happened with what was desired and planned
  - Formulate inferences about the interaction between student learning and teacher behavior by looking at student work

Reflection Conversation Part 2

- *Apply*
  - Discuss alternative teaching practices
  - Develop insights about practice and self
  - Examine what was learned about teaching and process of mentoring
  - Consider what to apply in subsequent situations

Preparation for a reflection conversation

- Review the teacher's learning goal.

- Review the data collected about teaching behaviors and student learning.

- Select appropriate stance.

- Prepare/select questions or prompts for the conversation.

Potential prompts/questions for reflection conversations

Teacher decision making

- Teachers make many decisions as they teach. I am interested in the decisions you found yourself making during this lesson. Tell me about some of them and share your decision making process. What effect did your decisions have on student learning?
- In what ways was this lesson different from what you planned? What do you think accounted for those differences? What was the effect of the shift from what you had intended?
- What did you notice about your own thinking and decision making during the lesson? How did your thinking and decision making affect students?
- What evidence do you have from the lesson that tells you if you students achieved the lesson's goals?
- What learning(s) are you taking away from this lesson that you can apply to future lessons?

Student learning

- What did you notice about student learning during the lesson?
- What are some specific examples of student learning that met your expectations?
- What are examples of student learning that did not meet your expectation?
- Think about a student who was struggling during the lesson. What part of the lesson helped clarify the student's misunderstanding?
- When you were talking with students as they were practicing the learning, working in groups, or working independently, what did you notice about their work?
- How did the students' questions and comments help you understand what helped and hindered their learning?
- How were students engaged in the lesson and applying the content in authentic ways?
- How do you know the students left with a clear understanding of the lesson and any homework they had?
- What did you learn about your students' learning today that will help you in the future as you plan and teach?

Instructional practices

- How did students know what was expected in terms of behavior in your classroom?
- What prepared students for today's lesson and helped them be ready to learn?
- What was the outcome of the lesson? Which standard(s) were the focus of the lesson?
- What did you do to make the outcome clear to the students?
- How were students making connections with today's lesson and previous and future ones?
- Talk about teaching strategy or methodology you used and how it fit with this lesson's content.
- What other strategies might have been used?
- How did you assess students throughout the lesson?

- What did/will you do for the students who have a difficult time achieving the lesson?
- What did/will you do to reinforce the learning for students who need additional reinforcement?
- What did you do while the students were practicing the learning independently or in groups?
- What are your plans for tomorrow? Where will you take this from here?
- How did you accommodate different students' learning styles, needs, interests, cultural background, and academic levels?
- How did you determine what instructional materials or resources (board, trade books, text, handout, video, etc.) to use during the lesson?
- What lessons are you taking away about your own teaching practices from today's class that will strengthen your practice in the future?

Notes on model reflection conversation

Practice Reflection Conversation

Plan to gather data from classroom observation linked to the teacher-learning goal and teacher preparation competencies. Revisit Module 3 to review these.

Gather data from the classroom observation.

Analyze data gathered and plan powerful questions for reflection conversation.

Teacher questions	Student responses	Level literal-inferential) and direction of questions (which students)

Potential questions to ask the teacher about the data as it relates to her goal.

Assignments

Prior to the next session, complete the following assignments

- Co-teach with a colleague or new/resident teacher. Reflect on the experience using the reflection form that follows.
- Observe in a classroom to practice gathering data. Bring data collected to next session to share.
- Reflect on the cultural responsiveness in your own classroom by identifying practices implemented that align with the principles discussed. Use the reflection sheet that follows.
- Hold a reflection conversation. Complete the reflection conversation analysis below.

Co-teaching reflection:

What agreements did you establish prior to co-teaching? How did you decide those were the most important ones to establish?

What were the learning goals for you and your co-teacher for this co-teaching experience? How did you assess your success?

Which co-teaching method(s) did you use? Describe the factors you and your resident teacher/colleague considered to choose the co-teaching method you did.

What unanticipated surprises, issues, or challenges did you encounter and how did you and your co-teacher handle them? If you didn't have any, what might have contributed to the absence of them?

What will you do in future co-teaching situations, particularly with resident teachers, that will strength the opportunity for both teacher and student learning?

Key Shifts in Mathematics

Consider the shifts in mathematics standards and instruction. Examine how your current instruction aligns with the shifts. Provide several examples from your classroom that demonstrate how you are applying the shifts. Bring samples of student work as evidence of your application of the shifts.

Reflection conversation analysis:

Describe briefly the reflection conversation. With whom did you hold the conversation? What was the teacher's learning goal? What was the student learning goal?

Which stance (consult, collaborate, mediate) did you intend to take? Explain your reason for selecting this stance?

What were some prompts or questions you prepared/selected for the conversation? Analyze how two of those prompts or questions aligned with your selected stance.

What doid you learn about your use of communication skills (listening, pausing, paraphrasing, and positive presuppositions) during the reflection conversation?

What did the teacher learn as a result from this reflection conversation?

What did you learn as a mentor from this reflection conversation?