Louisiana Department of Education
Mentor Teacher Training

Module 5:
Delivering High-Quality, Standards-Aligned Mathematics Instruction

Elementary Cohort

Facilitated by Learning Forward

Mentor Training Goals

1. Build strong relationships with their new and resident teachers.
2. Use quantitative data (i.e. student achievement results from summative and formative assessments) and qualitative data (i.e. student work and feedback, classroom observations, peer and supervisor feedback) to identify and prioritize new and resident teacher's strengths and areas for growth based on teacher **certification competencies and performance expectations**.
3. Implement a continuum of support and coaching techniques to build new and resident teacher knowledge and skill in content and content-specific pedagogy and self-analysis and reflection skills.
   - Set short- and long-term professional growth goals based on student results.
   - Create a logical sequence of coaching opportunities to build new/resident teacher's skill over time to reach goals.
   - Identify and leverage high-quality, evidence-based resources to support new and resident teachers' specific needs.
   - Lead effective feedback/coaching conversations grounded in student evidence (includes difficult conversations).
   - Track new and resident teacher progress.
   - Model and facilitate resident self-reflection and improvement.
4. Deepen content knowledge and content-specific pedagogy to support continued development of teacher competencies in the respective content areas.
5. Assess and develop mentor competencies in their discipline to identify strengths and gaps and to develop areas of need. These assessments are based on competencies and student results.

Module 5 Outcomes

Mentor teachers will:

- Gain clarity on how the mathematics standards look when executed well in curriculum and instruction by experiencing an EngageNY lesson from a learner's perspective.
- Implement instructional strategies that foster conceptual understanding, procedural skill and fluency, and application.
- Determine teacher moves that promote a positive classroom culture and support perseverance in solving problems.
- Implement strategies that support a growth mindset with students.

Module 5 Key Points

- Intentional teacher moves support focus, coherence, and rigor around the mathematics content.
- EngageNY provides instructional strategies that foster conceptual understanding, procedural skill and fluency, and application.
- Teachers' beliefs about learning are reflected in the culture of their classrooms and inform the ways in which they interact with their students.

Module 5 Agenda

8:30-12:00

- Review and revisit Modules 3 & 4
- Reflection on assignments
- High-quality standards-aligned mathematics instruction

12:45-4:00

- Instructional strategies for conceptual understanding of mathematics
- Positive classroom environment for mathematics instruction
- Student mindset
- Teacher Preparation Competencies in mathematics

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 and the use of personal technology

Louisiana DOE Mentor Training, Module 5, Elementary Cohort

Reflections on Module 3-4 assignments

Co-teaching reflection

1. What agreements did you establish prior to co-teaching? How did you decide those were the most important ones to establish?
2. What were the learning goals for you and your co-teacher for this co-teaching experience? How did you assess your success?
3. 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.
4. 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?
5. 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

1. Share evidence from your classroom that demonstrates your application of the math shifts. Describe how the practices influenced student learning.

Reflection conversation

1. 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?
2. Which stance (consult, collaborate, mediate) did you intend to take? Explain your reason for selecting this stance?
3. 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.
4. What did you learn about your use of communication skills (listening, pausing, paraphrasing, and positive presuppositions) during the reflection conversation?
5. What did the teacher learn as a result from this reflection conversation?
6. What did you learn as a mentor from this reflection conversation?

Successes	Challenges	Insights

MENTOR TEACHER

Math Content: Grades K-5
Module 1: Setting the Foundation for Implementing the Curriculum
Session 3: Seeing the key shifts in action

Outcomes:

- Gain clarity on how the mathematics standards manifest in the elementary classroom when executed well in curriculum instruction.
- See effective instructional strategies in action that can be implemented directly in their classrooms.
- Identify implications for delivering high-quality, standards aligned mathematics instruction using the EngageNY resources.

Key shifts of the LSSM

Evidence of the key shifts

Use the handout on p. 19 to:

- Check off student behaviors/actions that you observed.
- Record any observations you made that serve as evidence.

Handout P-06
Looking for Evidence of the Key Shifts

Focus	Evidence
☐ The learning goal(s) of the lesson supports grade level standard(s)	
Coherence	
☐ Students build new understandings onto foundations built in previous years. ☐ Students set the foundation for future learning ☐ The teacher reinforces standards that are major work in the grade when teaching supporting or additional content.	
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 in multiple situations. ☐ Students create and use a variety of models to analyze relationships in context. ☐ 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.	
Applications	
☐ 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 descriptions are adapted from Illustrative Mathematics' (IM's) Tableaux, CE Standards for Mathematical Practice, Conversations and Explorations for K-5 Teams, NF, 9/14/2015 at http://commoncoresheets.com/2014/06/12/1-1-administrator-of-the-course-number/

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Looking for evidence of the SMPs in the mathematics classroom

Mark had a stick of 9 green linking cubes. His friend gave him 4 yellow linking cubes. How many linking cubes does Mark have now?

9+6	8+4
9+7	8+7
8+9	7+5
8+3	

Evidence of the key shifts

Use the handout on p. 19 to:

- Check off student behaviors/actions that you observed.
- Record any observations you made that serve as evidence.

Handout P-06
Looking for Evidence of the Key Shifts

Focus	Evidence
☐ The learning goal(s) of the lesson supports grade level mastery(ies)	
Coherence	
☐ Students build new understandings onto foundations built in previous years. ☐ Students set the foundation for future learning ☐ The teacher reinforces standards that are major work in the grade when teaching supporting or additional content.	
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 in multiple situations.	
☐ Students create and use a variety of models to analyze relationships in context.	
☐ 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 descriptions are aligned from Visualizing Mathematics: TEA's Pathways CCI Standards for Mathematical Practice: Connections and Explorations for K-5 Teacher, NP. Available at http://www.tea.texas.gov/2010/06/11/ccr-1-administrator-of-the-course-modules

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Session 3 reflection

Four Corners

Corner A: Coherence	Corner C: Conceptual Understanding
Evidence of the Key Shifts	
Corner B: Procedural Skills and Fluency	Corner D: Application

MENTOR TEACHER

Math Content: Grades K-5

Module 1: Setting the Foundation for Implementing the Curriculum

Session 4: Exploring the EngageNY Curriculum

Outcomes

- Identify implications for delivering high-quality, standards-aligned mathematics instruction.
- Analyze EngageNY lesson components to ensure alignment to the standards.
- Implement instructional strategies that foster conceptual understanding, procedural skill and fluency, and application with students.

What is alignment?

Alignment is more than…

- A chart
- A textbook correlation
- A scope and sequence
- A curriculum guide
- A testing plan

These things imply alignment, but they do not achieve alignment.

What is alignment?

Adapted from the work of Fenwick English

What is alignment?

Alignment means ***EVERY*** educator…

- Understands what is expected of students.
- Understands these expectations within the context of the K–12 program.
- Accepts responsibility for meeting these expectations.

What are the main components of the EngageNY curriculum resource?

What is the purpose of each component?

pp. 20-29

- Fluency Practice
- Application Problem
- Concept Development
- Problem Set
- Student Debrief
- Exit Ticket
- Homework

Lesson 4

Objective: Make a ten to add within 20.

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(8 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
Total Time	(60 minutes)

Fluency Practice (12 minutes)

- Grow Tens and Ones 2.OA.2 (3 minutes)
- Make Ten 1.OA.6 (3 minutes)
- Make the Next Ten Within 100 1.OA.6 (4 minutes)
- Take Out One 2.OA.2 (2 minutes)

Grow Tens and Ones (3 minutes)

Materials: (T) Linking cubes with ten sticks and extra cubes, place value chart. (S) Personal white board

Note: This fluency activity reviews place value as students analyze two representations of two-digit numbers.

T: Show the number of cubes I show with quick tens and ones.

S: (Show 2 linking cube ten sticks and 4 ones.)

T: (Draw as pictured to the right.)

S: (Have not your boards. Tell me the number.

S: 24.

T: Draw the number I show with quick tens and ones.

T: (Write the number 42 on the place value chart.)

S: (Draw as pictured to the right.)

T: Tell me the number.

S: 42.

For the next minute, represent 18 and 81, 37 and 73, 29 and 92, alternating between showing the smaller number of each pair with cubes and the larger number with the place value chart.

Unpacking the EngageNY lesson

2.OA.2

- Fluently add and subtract within 20 using mental strategies.[2] By the end of Grade 2, know from memory all sums of two one-digit numbers.

[2] See standard 1.OA.6 for a list of mental strategies.

Mental Strategies: counting on;
making ten;
decomposing a number leading to a ten;
using the relationship between addition and subtraction;
creating equivalent but easier known sums

Evidence of the key shifts

Session 4 reflection

Personal reflection

- How will unpacking EngageNY lessons for the standards and key shifts affect your planning and instruction?
- As a result of your learning in sessions 3 and 4, identify one *action* you will take to effectively plan for instruction.
- How will unpacking the EngageNY lesson help you support residents to become effective teachers of mathematics?

MENTOR TEACHER

Math Content: Grades K-5

Module 1: Setting the Foundation for Implementing the Curriculum

Session 5: Classroom Culture

Outcomes:

- Determine teacher moves that promote a positive classroom culture and support perseverance in solving problems.
- Reflect on their own beliefs about learning and how these beliefs influence students.
- Implement strategies that support a growth mindset with students.

"When students realize they can succeed in mathematics, they are transformed – you can see them raise their aspirations for school and life."

— Uri Treisman

University Distinguished Teaching Professor,
Professor of Mathematics, Professor of Public Affairs, and
Executive Director, The Charles A. Dana Center at
The University of Texas at Austin

Quiz, p. 31

Give yourself 4 points each time you answered AGREE on the gray squares.

Subtract 2 points for each time you answered AGREE on the white squares.

Fixed versus malleable intelligence

Read Dweck's article, "The Perils and Promises of Praise," and consider the following:

https://tinyurl.com/dweckMT5Math

What confirms your current knowledge and beliefs?	What questions does this research raise for you? (Dweck, 2007)

Fixed versus malleable intelligence

Characteristics of students who view intelligence as fixed

- Avoid challenges and seek easy successes—they pass up valuable learning opportunities
- Desire to "look smart" at all costs
- Worry about failure and question their ability

Characteristics of students who view intelligence as malleable

- Pursue and enjoy challenges
- Care less about "looking smart"
- Engage in self-monitoring and self-instruction

Supporting a growth mindset

- Provide opportunities for collaboration and discourse.
- Encourage high, equitable levels of student participation.
- Encourage a broad range of competencies/approaches.
- Promote cooperative learning and shared accountability.
- Provide autonomy/choice in task, team, and processes.
- Model and monitor the climate for interactions among students.

What are the implications?

Based on your reading and discussion:

- How might this research inform the ways in which you interact with and teach your residents to interact with and teach students?
- How might this research impact the culture of learning in your classroom and the development of a resident?

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

Looking for Evidence of 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. ☐ The teacher reinforces standards that are major work in the grade when teaching supporting or additional content.	
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 that are 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: Author. Available at http://commoncoretools.me/2014/02/12/k-5-elaborations-of-the-practice-standards

Lesson 4

Objective: Make a ten to add within 20.

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(8 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**

Fluency Practice (12 minutes)

- Draw Tens and Ones **2.OA.2** (3 minutes)
- Make Ten **2.OA.2** (3 minutes)
- Make the Next Ten Within 100 **2.OA.2** (4 minutes)
- Take Out One **2.OA.2** (2 minutes)

Draw Tens and Ones (3 minutes)

Materials: (T) Linking cubes with ten-sticks and extra cubes, place value chart (S) Personal white board

Note: This fluency activity reviews place value as students analyze two representations of two-digit numbers.

T: Draw the number of cubes I show with quick tens and ones.
T: (Show 2 linking cube ten-sticks and 4 ones.)
S: (Draw as pictured to the right.)
T: Show me your boards. Tell me the number.
S: 24.
T: Draw the number I show with quick tens and ones.
T: (Write the number 42 on the place value chart.)
S: (Draw as pictured to the right.)
T: Tell me the number.
S: 42.

For the next minute, represent 18 and 81, 37 and 73, 29 and 92, alternating between showing the smaller number of each pair with cubes and the larger number with the place value chart.

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Make Ten (3 minutes)

Materials: (S) Personal white board

Note: This is a foundational skill for mastery of sums and differences to 20.

T: I'll say a number, and you say how many more to make ten.
T: 9. Get ready.
S: 1.
T: Write the addition sentence. (Pause.) Show me your boards.
S: (Show 9 + 1 = 10.)
T: (Scan each board, and accept 1 + 9 = 10, 10 = 9 + 1, etc.)
T: 8. (Pause as students write.) Get ready.
S: 2.
T: Write the addition sentence. (Pause.) Show me your boards.
S: (Show 8 + 2 = 10.)

Continue with the following possible sequence: 2, 5, 6, 4, 7, and 3.

Make the Next Ten Within 100 (4 minutes)

Materials: (T) Rekenrek (S) Personal white board

Note: In this fluency activity, students apply their knowledge of partners to ten to find analogous partners to 20, 30, and 40 to prepare for today's lesson. Keep them motivated to use the patterns by removing the Rekenrek at times.

T: (Show 19.) Say the number.
S: 19.
T: Write the number sentence, starting with 19, to get to or make the next ten on your personal white board.
S: (Write 19 + 1 = 20.)
T: (Scan the boards.) Tell me the addition sentence.
S: 19 + 1 = 20.
T: (Move 1 bead to make 20 as students answer.)
T: (Show 39.) Say the number.
S: 39.
T: Write the number sentence, starting with 39, to make the next ten on your personal white board.
S: (Write 39 + 1 = 40.)
T: (Scan the boards.) Tell me the addition sentence.
S: 39 + 1 = 40.
T: (Move 1 bead to make 40 as students answer.)

Continue with the following possible sequence: 15, 35, 85; 18, 48, 68; 12, 52, and 92.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Once the Rekenrek is removed, encourage students who need support to visualize the beads (ten-frames or 5-groups), or guide them to use fingers to model the number of ones in order to determine how many more make ten.

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Take Out One (2 minutes)

Materials: (S) Personal white board

Note: In the lesson, students add 9 and 6 by adding 9 and 1 and 5. They "take out 1" from 5.

T: Let's take out 1 from each number. I say 5. You write the number bond and say the two parts, 1 and 4.

T: 5.

S: (Draw number bond.) 1 and 4.

Continue with the following possible sequence: 3, 10, 4, 7, 9, 8, and 6.

Application Problem (8 minutes)

MP.2

Mark had a stick of 9 green linking cubes. His friend gave him 4 yellow linking cubes. How many linking cubes does Mark have now?

Note: This *add to result unknown* problem's tape diagram can be compared to that of Lesson 3 when a part was subtracted.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

"Mark's Linking Cubes" bridges into today's Concept Development of making a ten to add. Rather than teach the make ten strategy during the Application Problem, notice what strategies students are independently using, and integrate these observations into the Concept Development. During the Student Debrief, consider coming back to the Application Problem, and invite students to apply today's learning to show another way to solve the problem.

Concept Development (30 minutes)

Materials: (S) Personal white board

Part 1: Making ten from an addend of 9, 8, or 7.

Note: In Grade 1, students used ten-sticks and quick ten drawings extensively when making ten. Now in Grade 2, the objective is to work at the numerical level as soon as possible.

T: (Write 9 + 4 on the board.)

T: Let's draw to solve 9 + 4 using circles and Xs.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

If time or precision is a factor, create templates of pre-drawn circles to model addends of 9, 8, and 7. Then, students can attend to drawing Xs to complete the ten and model the remainder of the problem.

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T: (Quickly draw and count aloud 9 circles in a 5-group column as seen in the first image.)

T: How many Xs will we add?

S: 4 Xs.

T: (Using the X symbol, complete the ten and draw the other 3 Xs to the right as seen in the second image.)

T: Did we make a ten?

S: Yes!

T: Our 9 + 4 is now a ten-plus fact. What fact can you see in the drawing?

S: 10 + 3 = 13.

T: 10 + 3 equals?

S: 13.

T: So, 9 + 4 equals?

S: 13. (Write the solution.)

T: What did we take out of 4 so that we could make 10?

S: 1.

T: (Draw the number bond under 4 as shown to the right.)

T: (Write 9 + 5.)

T: Solve using a number bond. (If students want or need to draw, allow them to.)

Continue with the following possible sequence: 9 + 6, 9 + 7, 8 + 9, 8 + 3, 8 + 4, 8 + 7, and 7 + 5. Have students explain their work to a partner.

Part 2: Observing patterns.

T: Look at our list of problems where one part, or addend, is 9. Tell your partner what you notice about adding to 9.

S: You get 1 out! → The answer is 10 and 1 less than the other addend.

T: Look at the problems with 8 as an addend. Tell your partner what you notice.

S: You get 2 out! → You always take 2 out of the other addend.

T: How is solving 9 + 4 and 8 + 4 different?

S: We used 2 to make 10 when we added to 8 and 1 to make 10 when we added to 9. → We used a different number bond.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

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Student Debrief (10 minutes)

Lesson Objective: Make a ten to add within 20.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- Let's look at Problems 11–14. How are the problems the same and different?
- Do you notice a pattern that will help you memorize your 9-plus facts? What other patterns do you notice?
- Explain the strategy we reviewed today. Can you think of another problem that the make ten strategy will help us solve?
- Can you figure out the math goal of today's lesson? What name would you give this lesson?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

Name Lisa Date

Solve.

1. 9 + 3 = 12 (1 2)	2. 9 + 5 = 14 (1 4)
3. 8 + 4 = 12 (2 2)	4. 8 + 7 = 15 (2 5)
5. 7 + 5 = 12 (3 2)	6. 7 + 6 = 13 (3 3)
7. 8 + 8 = 16 (2 6)	8. 9 + 8 = 17 (1 7)

Solve.

9. 10 + 2 = 12; 9 + 3 = 12	10. 10 + 3 = 13; 9 + 4 = 13
11. 10 + 4 = 14; 8 + 6 = 14	12. 10 + 6 = 16; 7 + 9 = 16

13. Lisa has 2 blue beads and 9 purple beads. How many beads does Lisa have in all?

9 + 2 = 11 (1 1)

Lisa has 11 beads in all.

14. Ben had 8 pencils and bought 5 more. How many pencils does Ben have all together?

8 + 5 = 13 (2 3)

Ben has 13 pencils all together.

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Name _____ Date _____

Solve.

1. 9 + 3 = _____	2. 9 + 5 = _____
3. 8 + 4 = _____	4. 8 + 7 = _____
5. 7 + 5 = _____	6. 7 + 6 = _____
7. 8 + 8 = _____	8. 9 + 8 = _____

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Solve.

9. 10 + _____ = 12 9 + _____ = 12	10. 10 + _____ = 13 9 + _____ = 13
11. 10 + _____ = 14 8 + _____ = 14	12. 10 + _____ = 16 7 + _____ = 16

13. Lisa has 2 blue beads and 9 purple beads. How many beads does Lisa have in all?

Lisa has _____ beads in all.

14. Ben had 8 pencils and bought 5 more. How many pencils does Ben have altogether?

_____

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Name _____ Date _____

Solve.

1. 9 + 6 = ____	2. 8 + 5 = ____

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Name _____ Date _____

Solve.

1. 8 + 4 = ____ / \ 2 2 8 + 2 = 10 10 + 2 = 12	2. 9 + 7 = ____
3. 9 + 3 = _____	4. 8 + 6 = _____
5. 7 + 6 = _____	6. 7 + 8 = _____
7. 8 + 8 = _____	8. 8 + 9 = _____

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9. Solve and match.

A	B
10 + 2 = 12	9 + 8 = _____
10 + _____ = 13	9 + 6 = _____
10 + _____ = 17	7 + 6 = _____
10 + _____ = 15	6 + 8 = _____
4 + _____ = 14	3 + 9 = 12

10. Ronnie uses 5 brown bricks and 8 red bricks to build a fort.
How many bricks does Ronnie use in all?

Ronnie uses _____ bricks.

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Diamond Reflection
Unpacking the EngageNY Lesson

Observations: How are the mathematics content standards evident in the lesson?

Reflections: How does student engagement in the SMPs help develop conceptual understanding, procedural skill and fluency and application skills?

Other thoughts and considerations

Interpretations: What instructional strategies and facilitator moves brought out the content and practice standards?

Decisional: What am I going to do based on my learning?

What's Your Mindset?

Do NOT overthink these statements. Read each statement and put "agree" or "disagree" in the box to the left. This is a personal reflection, and results will not be shared. Please answer truthfully.

	My intelligence is something very basic about me that I can't really change.
	When I don't understand something, I like to slow down and try to figure it out.
	I am intimidated by academic challenges.
	I have been told by others that I am smart.
	Learning is fun.
	I often feel unmotivated to learn.
	When I don't do well in a subject, I think that I must not be very good at that particular subject.
	When I perform poorly academically, I do not get discouraged.
	When I don't understand something, I get very frustrated and want to give up.
	I shouldn't have to work as hard in subjects that I am naturally good at.

Quiz adapted from Baker-Kunst, S. (2010 January 13; originally posted 2008 March 6). The curse of the 'smart' student. *Extreme biology: Class connection*. Retrieved October 21, 2017, from https://extremebiology.wordpress.com/2010/01/13/the-curse-of-the-smart-student

For the next activity, please read the following article:

Dweck, C. S. (2007). The perils and promises of praise. *Educational leadership: Early intervention at every age [issue theme], 65(2)*, 34–39. Available at http://www.ascd.org/publications/educational-leadership/oct07/vol65/num02/The-Perils-and-Promises-of-Praise.aspx

Teacher Preparation Competencies

In your learning teams,

- Review the math content knowledge and content-pedagogy *Teacher Preparation Competencies*.
- Circle the key content and skills included in each one.
- Explain how the content studied in Module 4 and 5 relates to the competencies and will assist you in supporting your resident teacher to refine his or her content knowledge and content-specific pedagogy and to meet the competencies.

Partner Task

In turn, one assumes the role of the mentor and the other the role of the resident. The mentor explains to the resident how the math content relates to achievement of the competencies. In other words, why does the resident need to know the content you have learned to meet these competencies? Use specific examples.

The partner in the resident role then summarizes what the mentor says and offers feedback on the clarity, specificity, etc. of the explanation.

Switch roles and repeat.

Mathematics Teacher Competencies

INTRODUCTION

The mathematics teacher preparation competencies identify essential knowledge and skills for teacher candidates seeking certification in birth to kindergarten, pre-kindergarten – third grade, elementary grades 1-5, elementary grades 1-5 integrated to merged, mathematics grades 4-8, mathematics grades 4-8 integrated to merged, mathematics 6-12, and mathematics 6-12 integrated to merged.

CONTENT KNOWLEDGE COMPETENCIES

A. With respect to the academic standards for mathematics for the certification grade band and neighboring grade bands, the teacher candidate, at minimum, demonstrates the following competencies to plan for instruction, teach, and assess student learning:

1. Provides exact, explicit definitions of mathematical ideas and concepts using appropriate mathematical language.
2. Provides precise, accurate, useful descriptions of algorithms and procedures, including descriptions of the accuracy of alternative procedures or algorithms.
3. Exhibits an integrated, functional grasp of mathematical concepts and procedures.
4. Explains concepts and executes procedures flexibly, accurately, efficiently, and appropriately.
5. Models the mathematical dispositions and habits of mind described in the Practice Standards, including precision of language, logical thought, reflection, explanation, and justification.
6. Recognizes and uses the connections between the topics identified in the relevant standards and problems arising in real-world applications.
7. Portrays mathematics as sensible, useful, and worthwhile.

CONTENT PEDAGOGY COMPETENCIES

A. The teacher candidate applies knowledge of mathematical topics and their relationships within and across mathematical domains to identify key mathematical ideas and select or design mathematically sound lesson sequences and units of study that develop students' conceptual understanding, procedural skill and fluency, and ability to solve real-world and mathematical problems.

1. The teacher candidate appropriately sequences content for instruction within a lesson or unit of study and plans appropriate scaffolding to provide opportunities for students to access and master grade-level standards.
2. The teacher candidate anticipates student misconceptions which may arise during a lesson or unit of study, identifies key points in the lesson or unit to check for misconceptions, and identifies appropriate instructional strategies to respond to misconceptions, including but not limited to questioning, whole group discussion, problem sets, instructional tools and representations that make the mathematics of the lesson explicit.
3. The teacher candidate selects or designs standards-based tasks that use varied strategies, including but not limited to real-life applications, manipulatives, models, diagrams/pictures, that present opportunities for instruction and assessment.
4. The teacher candidate selects or designs practice sets that include scaffolding and differentiation of mathematical content to provide opportunities for students to develop and demonstrate mastery.
5. The teacher candidate identifies appropriate student groupings, for example pairs or small groups, to develop students' conceptual understanding, skill, and fluency with mathematical content as well as independent mathematical thinking.

B. The teacher candidate applies understanding of students' mathematical language development to provide regular opportunities during instruction for students to explain their understanding both in writing and orally through classroom conversations.

   1. The teacher candidate explains the connection between students' informal language to precise mathematical language to develop students' ability to use precise mathematical language in their explanations and discussions.

C. The teacher candidate applies understanding of the intersection of mathematical content and mathematical practices to provide regular, repeated opportunities for students to exhibit the math practices while engaging with the mathematical content of the lesson, including but not limited to the following:

   1. Uses appropriate prompting and questioning that allow students to refine their mathematical thinking and build upon one another's understanding of the mathematical content of the lesson.
   2. Poses challenging problems that offer opportunities for productive struggle, encouraging reasoning, problem solving, and perseverance in solving problems in the face of initial difficulty;
   3. Facilitates student conversations in which students are encouraged to discuss each other's thinking in order to clarify or improve their own mathematical understanding;
   4. Provides opportunities for students to choose and use appropriate tools when solving a problem; and
   5. Prompts students to explain and justify work and provides feedback that guides students to produce revised explanations and justifications.

D. The teacher candidate applies knowledge of mathematical topics and their relationships within and across mathematical domains to select or design and use a range of ongoing classroom assessments, including but not limited to diagnostic, formal and informal, formative and summative, oral and written, which determine students' mastery of grade-level standards in order to inform and adjust planning and instruction.

   1. The teacher candidate identifies errors, gaps, and inconsistencies in students' knowledge, skills, and mathematical reasoning to remediate or scaffold students' learning during lesson implementation, using, but not limited to, the following strategies:
      a. oral and written explanations of the elements and structures of mathematics and the meaning of procedures, analogies, and real life experiences;
      b. manipulatives, models, and pictures or diagrams; and
      c. problem sets.
   2. The teacher candidate uses trends in assessment results to plan lesson structure and sequence, instructional strategies, remediation and enrichment opportunities for students.

Module 5 Review

In your team, review the outcomes (p. 3) for Module 5. Share how you anticipate applying what you learned as a mentor.

Exit slip

Use an index card on your table. Write a brief note.

3 ideas I am taking away
2 actions I'll take based on what I learned
1 question I have about what I learned