



Math Common Core Overview: Module 3 – RIGOR- Grade 1

Slide	Topic	FACILITATOR NOTES	MATERIALS	GROUPINGS
Slide 1	Intro	<ul style="list-style-type: none"> Welcome to Common Core State Standards Instructional Shifts: Rigor for First Grade teachers presentation. Today we will be delving deeper to gain an understanding of what is expected with Common Core State Standards in First grade. 	<ul style="list-style-type: none"> KWL Graphic organizer on slide 3 First Grade Progressions in mathematics (for reference) Copies of the First Grade Common Core Standards in Math (for reference) Copies of Mathematical Practices (for reference) Rigor Sample Items (2 items) 	<ul style="list-style-type: none"> Whole Group
Slide 2	Transition slide	CCSS- Mathematics Overview	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group
Slide 3	Focus KWL: Rigor	<ul style="list-style-type: none"> Ask teachers to jot down 2 to 3 sentences for the first two sections of the graphic organizer on a piece of paper. The final section will be completed at the end of presentation 	<ul style="list-style-type: none"> Focus KWL 	<ul style="list-style-type: none"> Independent Work Group Share Out
Slide 4	The Hunt Institute	<ul style="list-style-type: none"> Before we begin, here is a brief video clip on the Importance of Mathematical Practices with a focus in the areas of reasoning and modeling. YOUTUBE VIDEO: If you do not have access to YouTube, you will need to download this video onto your laptop for sharing during your PD. http://www.youtube.com/watch?v=m1rxkW8ucAI&list=UUF0pa3nE3aZAFBMT8pqM5PA 4 minutes 2 seconds 	<ul style="list-style-type: none"> Access to internet 	<ul style="list-style-type: none"> Whole Group Discussion
Slide 5	Common Core State Standards for Mathematics: Three	<ul style="list-style-type: none"> In the next few slides, we will have a brief overview of the Common Core State Standards Instructional Shifts. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group



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	key Shifts			
Slide 6	CCSS Shifts Background	<ul style="list-style-type: none"> Allow teachers to read slide and share what they notice about the shifts or what they have learned about the shifts from previous presentations, PLCs, or readings. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group Discussion
Slide 7	The Why: Shift One Focus	<ul style="list-style-type: none"> Allow teachers to read the slide and briefly discuss how CCSS-M changes instruction from the way teachers have been expected to have taught math in the past. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group Discussion
Slide 8	The Why: Shift Two Coherence	<ul style="list-style-type: none"> Allow teachers to read the slide and briefly discuss how CCSS-M changes instruction from the way teachers have been expected to have taught math in the past. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group Discussion
Slide 9	The Why: Shift One Rigor	<ul style="list-style-type: none"> Allow teachers to read the slide and briefly discuss how CCSS-M changes instruction from the way teachers have been expected to have taught math in the past. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group Discussion
Slide 10	Transition slide	<ul style="list-style-type: none"> A Closer Look at: Coherence 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group
Slide 11	Rigor	<ul style="list-style-type: none"> What does rigor mean? Although it can have many different meanings, when describing the shifts of the Common Core State Standards, it does not mean “more difficult.” Instead rigor is about the depth of what is expected in the standards, and also about what a teacher or administrator should expect to see happening in the classroom, in curricular materials, in student engagement and application of concepts in problem solving situations. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group
Slide 12	Conceptual	<ul style="list-style-type: none"> Conceptual understanding: 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group



Math Common Core Overview: Module 3 – RIGOR- Grade 1

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	Understanding	<ul style="list-style-type: none"> Teachers teach more than “how to get the answer” and support students’ ability to access concepts from a number of perspectives so that students are able to see math as more than a set of mnemonics or discrete procedures. Students should be able to demonstrate deep conceptual understanding of core math concepts by solving short conceptual problems, applying math in new situations, and speaking about their understanding. 		
Slide 13	John Van De Walle quote	<ul style="list-style-type: none"> Read quote and allow teachers to discuss. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group
Slide 14	The Math Progressions	<ul style="list-style-type: none"> The Progressions documents provide resources that aid in... <ul style="list-style-type: none"> developing conceptual understanding often building on children’s informal knowledge support conceptual knowledge and develop informal strategies to solve problems within the domain refining the informal strategies to develop fluency with standard procedures http://ime.math.arizona.edu/progressions/ Available resources for First Grade teachers include: <ul style="list-style-type: none"> Operations & Algebraic Thinking Number and Operation in Base Ten Measurement & Data Geometry 	<ul style="list-style-type: none"> Progressions documents can be used now or introduced for use with Slide 16 	<ul style="list-style-type: none"> Whole Group/ Small Group Discussion of Progressions
Slide 15	Frequently Asked Questions	<ul style="list-style-type: none"> Here are a few frequently asked questions about the idea of rigor and balance. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group Discussion



Math Common Core Overview: Module 3 – RIGOR- Grade 1

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		<ul style="list-style-type: none"> • <i>How can we assess fluency other than giving a timed test?</i> • When you talk about assessment items that get at fluency, it is not always only going to be weekly timed tests. That may be an instructional practice that works for certain people, but it is not a mandate that everyone across the country will be doing timed tests. There are lots of different ways to get to this idea of fluency and there are lots of different ways to know if a student is fluent in something. On a side note, it is important to remember that assessing fluency is not necessarily the same as practicing fluency. Often schools will do timed tests 3 days a week and think they are fulfilling the “fluency requirement.” Students need opportunities to practice fluency, as well. • <i>Is it really possible to assess conceptual understanding? What does it look like?</i> • So, how do you take the math that we want students to know out of context and how do we ask them something that just by doing the problem will tell us that they have conceptual understanding? • Asking students to show work and explain can be informative, but it isn’t the only way to assess conceptual understanding and can become tiring for students. • <i>Lastly, are the Common Core Standards in Math all about application and meaningful tasks?</i> • It is a common misconception that CCSSM is only 		



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		<p>about rich application tasks. That is only one piece of the puzzle. You cannot just do these tasks and think that everything else is going to happen. This is not a criticism of the tasks that are out there.</p> <ul style="list-style-type: none"> • The tasks are often good. Performance tasks are great, but where in those performance tasks are you getting at procedural skill and fluency? Where are you getting at conceptual understanding? • We cannot just expect those things to happen if we only do those tasks. Remember that rigor in the Standards is a balance of time spent on conceptual understanding, procedural skill and fluency, and application. The Standards themselves will typically guide the reader to what aspect of rigor is expected. 		
Slide 16	1 st Grade Progressions	<ul style="list-style-type: none"> • This is an example from the Progressions for the Common Core State Standards in Mathematics document located at: http://ime.math.arizona.edu/progressions/ • In this example, the student is able to apply conceptual understanding of core math concepts and apply them while clearly speaking about their understanding • CCSS.Math.Content.1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. • CCSS.Math.Content.1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete 	<ul style="list-style-type: none"> • Progressions documents 	<ul style="list-style-type: none"> • Whole Group/ Small Group Discussion of Progressions



Math Common Core Overview: Module 3 – RIGOR- Grade 1

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		models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.		
Slide 17	Non-example	<ul style="list-style-type: none"> Here is an example of a place value chart assignment. Ask teachers to determine if this is an example of that would allow them to assess student conceptual understanding. This is NOT an example of work that would elicit conceptual understanding. Assessing whether students have conceptual understanding of place value by completing this worksheet would be difficult at best. It would be fairly obvious to a student who does not understand place value that the first number goes with hundreds, the 2nd number with tens and so on. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group
Slide 18	Procedural Skill and Fluency	<ul style="list-style-type: none"> The next aspect of rigor is procedural skill and fluency. Allow teachers to read the slide. Discuss how this is not memorization and that it is the result of a carefully laid out learning progression over the years, starting in kindergarten and progressing through middle school. Make sure teachers understand that they can't expect fluency to be a natural outcome without addressing it specifically in the classroom and in our materials. Some students might require more practice than others. There is not one approach to get to speed and 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group Discussion



Math Common Core Overview: Module 3 – RIGOR- Grade 1

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		accuracy that will work for all students.		
Slide 19	The Hunt Institute	<ul style="list-style-type: none"> • Before we begin, here is a brief video clip on the Importance of Mathematical Practices with a focus in the areas of reasoning and modeling. • YOUTUBE VIDEO: If you do not have access to YouTube, you will need to download this video onto your laptop for sharing during your PD. • http://www.youtube.com/watch?v=ZFUAV00bTwA&list=UUF0pa3nE3aZaFBMT8pqM5PA • 1 minute 57 seconds 	<ul style="list-style-type: none"> • Access to internet 	<ul style="list-style-type: none"> • Whole Group Discussion
Slide 20	Fluency	<ul style="list-style-type: none"> • The word <i>fluency</i> was used judiciously in the Standards to mark the endpoints of progressions that begin with solid underpinnings and then pass upward through stages of growing maturity. 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Whole Group
Slide 21	Fluency Chart	<ul style="list-style-type: none"> • This chart shows a breakdown of the required fluencies in grades K-6. • Some of these fluency expectations are meant to be mental and others with pencil and paper. But for each of them, there should be no hesitation about how to proceed in getting the answer with accuracy. • Allow teachers to discuss ways to integrate fluency of addition and subtraction facts within 10 in their own classrooms. 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Whole Group
Slide 22	Application of Skills in Problem Solving Situations	<ul style="list-style-type: none"> • Using mathematics in problem solving contexts is the final piece that supports learning in the math classroom. It is the “why we learn math” piece. It is so we can apply it in situations that require mathematical knowledge. There are requirements for application all 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Small Group Discussion • Whole Group Share Out



Math Common Core Overview: Module 3 – RIGOR- Grade 1

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		<p>the way throughout the grades in the CCSS.</p> <ul style="list-style-type: none"> • Allow teachers to read the slide. <ul style="list-style-type: none"> ○ Students are expected to use math and choose the appropriate concept for application even when they are not prompted to do so. ○ Teachers provide opportunities at all grade levels for students to apply math concepts in “real world” situations. ○ Teachers in content areas outside of math, particularly science, ensure that students are using math – at all grade levels – to make meaning of and access content. • Teachers can’t just focus solely on application. Students need opportunities to gain deep insight into the mathematical concepts they are using and also develop fluency with the procedures that will be applied in these situations. The problem-solving aspect of application is what’s at stake here—if we attempt this with a lack of conceptual knowledge and procedural fluency, the problem just becomes three times harder. Yet, we don’t want to save all the application for the end of the learning progression. It can be motivational and interesting, and there is a need for students at all levels to connect the mathematics they are learning to the world around them. 		
Slide 23	What is looks like in the classroom	<ul style="list-style-type: none"> • Teachers in the United States need to learn to look at problems and ask, “How can I use this problem to 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Small Group Discussion



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		teach the mathematics of this unit/concept?" and NOT "How can I teach my kids to get the answer to this problem?"		<ul style="list-style-type: none"> Whole Group Share Out
Slide 24	Depth of Knowledge	<ul style="list-style-type: none"> Teachers also need to consider Depth of Knowledge when planning instruction to ensure students are taught at high levels of rigor. Allow teachers to discuss ways to ensure DOK levels in first grade are not always at Level 1. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Small Group Discussion Whole Group Share Out
Slide 25	Transition Slide	<ul style="list-style-type: none"> Rigor in First Grade 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group
Slide 26	Operations and Algebraic Thinking 1.OA	<ul style="list-style-type: none"> Have the teachers work to complete the problem and discuss. <p>Operations and Algebraic Thinking 1.OA</p> <ul style="list-style-type: none"> Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. "This instructional task can be thought of as a sequel to K.OA.3, which asks students to consider all the decompositions of a number into two addends. Because first grade students may have trouble reading this task even though they are intellectual capable of working on this problem, it will help if the teacher reads the prompt to the students and then has them work together in pairs or small groups. Some students will interpret "most" to mean "strictly greater than" and some will allow for the possibility that "most" and 	<ul style="list-style-type: none"> Rigor 1.OA Problem Handout 	<ul style="list-style-type: none"> Individual Small Group Discussion Whole Group Share Out

Math Common Core Overview: Module 3 – RIGOR- Grade 1

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		<p>"second most" are actually equal. Either interpretation of "most" is fine as long as the students are consistent with this interpretation throughout. Similarly, whether a vase can remain empty can be left to students and teachers." IllustrativeMathematics.org</p>		
Slide 27	Number and Operations in Base Ten 1.NBT	<ul style="list-style-type: none"> • Have the teachers work to complete the problem and discuss. <p>Number and Operations in Base Ten 1.NBT</p> <ul style="list-style-type: none"> • Use place value understanding and properties of operations to add and subtract. • c. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. • “The purpose of this task is for students to relate addition and subtraction problems to money and to situations and goals related to saving money. This problem can be adjusted based on where students are in their understanding of addition involving two digit numbers. This task has students adding two 2-digit numbers that require regrouping, and is therefore the most advanced type of addition problem that first graders will encounter. As a result, this is a very 	<ul style="list-style-type: none"> • Rigor 1.NBT Problem Handout 	<ul style="list-style-type: none"> • Individual • Small Group Discussion • Whole Group Share Out



Math Common Core Overview: Module 3 – RIGOR- Grade 1

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		<p>challenging instructional task for first grade students and they should have access to the appropriate tools when working on it. 1.NBT.4 also indicates that students should be able to add a 1-digit number to a 2-digit number and a 2-digit number and a multiple of 10 with greater fluency than two two-digit numbers. If students are working on either of these simpler types of problem, then the item that Louis wants to buy for himself could be, for example, a trip to the movies for \$8 or a toy for \$20. The second solution shows how students who can mentally add 10 to a 2-digit number without counting (see 1.NBT.5) might approach the task.</p> <ul style="list-style-type: none"> Teachers can make the problem more personal by letting the student choose a toy he/she wants and the toy their sibling or friend may want and researching the costs. If students do this type of research, they will be engaging in MP 4, Model with mathematics. Students can also choose how much money they want to donate and for what cause. If the students in the class don't receive allowance, the child in the task can make money by helping a neighbor (perhaps walking a dog or bringing in the mail).” Illustrative Mathematics.org 		
Slide 28		<ul style="list-style-type: none"> “The purpose of this task is to give students an opportunity to compose and decompose polygons to make rectangles. This is a challenging problem for first graders and it would be INAPPROPRIATE to use it as an assessment. However, if presented as a 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group Share Out

Math Common Core Overview: Module 3 – RIGOR- Grade 1

Slide	Topic	FACILITATOR NOTES	MATERIALS	GROUPINGS
		<p><u>brainteaser it can be useful for giving the students practice in recognizing rectangles, and stimulate interest as students compete to try to find the most rectangles.</u></p> <ul style="list-style-type: none"> Students could work in teams and would benefit from having lots of copies of the figure and colored pencils at hand. Then students could compare their rectangles and sort them into piles which contain the same rectangles to help them decide if two rectangles found by different students are actually the same rectangle. This will help reduce the chances that a rectangle gets counted twice. Geometry 1.G Reason with shapes and their attributes. <ul style="list-style-type: none"> c. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. 		
Slide 29	Transition Slide	<ul style="list-style-type: none"> Group Discussion 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Whole Group
Slide 30	Shift One: Question One	<ul style="list-style-type: none"> Teachers teach more than “how to get the answer” and support students’ ability to access concepts from a number of perspectives so that students are able to see math as more than a set of mnemonics or discrete procedures. Question One: <i>“What does it mean for students to have a Conceptual</i> 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Small Group Discussion Whole Group Share Out



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Slide	Topic	FACILITATOR NOTES	MATERIALS	GROUPINGS
		<p><i>Understanding and why is it important in the CCSS?"</i></p> <ul style="list-style-type: none"> Students should be able to demonstrate deep conceptual understanding of core math concepts by solving short conceptual problems, applying math in new situations, and speaking about their understanding. 		
Slide 31	Shift One: Question Two	<ul style="list-style-type: none"> Allow teachers to discuss ways to integrate fluency of addition and subtraction facts within 10 in their own classrooms. Question Two: <i>"What is the Fluency expectation for First Grade and how are teachers supposed to support students their learning process of these?"</i> Some of these fluency expectations are meant to be mental and others with pencil and paper. But for each of them, there should be no hesitation about how to proceed in getting the answer with accuracy. Practices in classrooms will vary. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Small Group Discussion Whole Group Share Out
Slide 32	Shift One: Question Three	<ul style="list-style-type: none"> Question Three: <i>"What are the three key goals of the Application of Problem Solving?"</i> <ul style="list-style-type: none"> Students are expected to use math and choose the appropriate concept for application even when they are not prompted to do so. Teachers provide opportunities at all grade levels for students to apply math concepts in "real world" situations. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Small Group Discussion Whole Group Share Out



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Slide	Topic	FACILITATOR NOTES	MATERIALS	GROUPINGS
		<ul style="list-style-type: none"> ○ Teachers in content areas outside of math, particularly science, ensure that students are using math – at all grade levels – to make meaning of and access content. 		
Slide 33	Focus KWL: Rigor	<ul style="list-style-type: none"> ● Ask teachers to jot down 2 to 3 sentences for the remaining section of the graphic organizer on a piece of paper. 	<ul style="list-style-type: none"> ● Focus KWL 	<ul style="list-style-type: none"> ● Independent Work ● Group Share Out
Slide 34	Resources	<ul style="list-style-type: none"> ● www.corestandards.org ● http://ime.math.arizona.edu/progressions/ ● www.insidemathematics.org ● www.teachingchannel.org ● www.achievethecore.org ● www.illustrativemathematics.org ● commoncoretools.me 	<ul style="list-style-type: none"> ● Internet access 	<ul style="list-style-type: none"> ● Whole Group
Slide 35	Next Steps?	<ul style="list-style-type: none"> ● Group Discussion on the next steps at the district level, school level, and classroom level. 	<ul style="list-style-type: none"> ● N/A 	<ul style="list-style-type: none"> ● Small Group Discussion ● Whole Group Share Out