



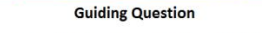
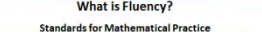
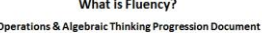
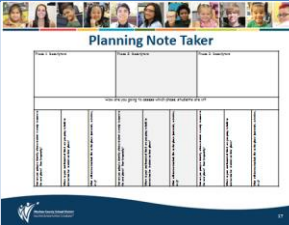



Implementing the Nevada Academic Content Standards

Talking About Computational Procedures (Option 1)

Slides	Slide Notes	Additional Notes
 <p>1. Whole class discussions can help students use computational procedures in accurate and efficient ways.</p> <p>2. Discussion can help students build connections between procedures and their underlying concepts.</p> <p>3. Classroom discussions can help students think of computational skills as tools that can be used to solve a wide variety of problems.</p> <p>4. Learning based on memorization is often forgotten and not readily transferred.</p>	<p>Background for Facilitator: Option 1 and 2 p. 120 “About This Chapter”</p> <p>Presentation: Distribute “Stop and Jot” note taker document to teachers. Say, “Stop and Jot what your thoughts are regarding these statements in the middle column.” After individuals have written their own thoughts, share out with a partner. This will be revisited at end of the presentation, as an exit ticket.</p>	
 <p>Essential Questions</p> <ul style="list-style-type: none"> • What strategies can we use to enhance our instruction so students learn mathematics with understanding? • What does this look and sound like? 		
 <p>Objectives</p> <ul style="list-style-type: none"> • Explore what research says about productive procedural fluency development and instruction. • Develop an implementation plan for fact fluency instruction and assessment in your classroom. 	<p>Background for Facilitator: Specific to Option 1.</p> <p>Presentation:</p>	
 <p>Four Steps Toward Productive Talk</p> <p>Helping Individual Students Clarify and Share Their Own Thoughts</p> <p>Helping Students Orient to the Thinking of Others</p> <p>Helping Students Deepen Their Own Reasoning</p> <p>Helping Students Engage with the Reasoning of Others</p>	<p>Background: The purpose of this slide is to connect to prior learning from the Fall/Winter mathematics “pink” Wednesdays.</p> <p>Presentation: Connection to the work that was engaged in the Fall 2013. The four steps provide a structure for analyzing and planning for components of productive classroom discussion. Consider having participants think about the ‘talk moves’ they have been using to support the productive classroom discussion and moving student thinking and reasoning between these four steps.</p>	
 <p>Guiding Question</p> <p>How can we use targeted and meaningful assessment for identifying students’ fact fluency instructional needs?</p>	<p>Background for Facilitator: Specific to Option 1</p> <p>Presentation: Here’s our guiding question for today’s work.</p>	
 <p>What is Fluency?</p> <p>Standards for Mathematical Practice</p> <p>The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these is the “habit of mind” of problem solving, reasoning and proof, communication, representation, and connections. The second is the range of mathematical proficiencies specified in the National Research Council’s report, <i>Adding It Up</i>: reasoning, strategic competence, procedural understanding, conceptual understanding of mathematical concepts, operations and relations, procedural fluency in computational procedures, fluency with numbers, fluency and operations, and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy).</p>	<p>Background for Facilitator: This definition comes from p. 6 of the CCSS-M (NACS) in the Standards for Mathematical Practice</p> <p>Presentation:</p>	
 <p>What is Fluency?</p> <p>Operations & Algebraic Thinking Progression Document</p> <p>The word <i>fluent</i> is used in the Standards to mean “fast and accurate.” Fluency in each grade involves a mixture of just knowing “some answers, knowing some answers from patterns (e.g., “adding 0 gets the same number”), and knowing some answers from the use of strategies. It is important to push sensitivity and encourage inquiry toward fluency of the designated numbers at each grade level, recognizing that fluency will be a mixture of these kinds of thinking which may differ across students. The extensive work relating addition and subtraction means that addition can be frequently be solved by thinking of the related addition, especially for smaller numbers. It is also important that these patterns, strategies and decompos-</p>	<p>Background for Facilitator: Option 1</p> <p>-This definition comes from p. 18 of the Operations & Algebraic Thinking Progression Document</p> <p>-Van de Walle defines mastery of a basic facts as, “means that a child can give a quick response (in <i>about</i> 3 seconds) without resorting to nonefficient means, such as counting.” <u>Teaching Student-Centered Mathematics</u> Volume 1 Gr. Pre-K-3, Chapter 10 p. 153</p>	

	<p>-Van de Walle points out that, “When taught basic facts via rote memorization, many children with learning disabilities continue to use counting strategies because they do not independently develop thought processes or other strategies that move beyond counting. However, they can be very successful in learning their basic facts when the emphasis is on using strategies. In addition, drill can cause unnecessary anxiety and undermine children’s interested and confidence in mathematics.” <u>Teaching Student-Centered Mathematics</u> Volume 1 Gr. Pre-K-3, Chapter 10 pp. 154-155 -If available, read pp. 153-156 of <u>Teaching Student-Centered Mathematics</u> Volume 1 Gr. Pre-K-3</p> <p>Presentation:</p> <p>- Read from the beginning of the paragraph to the end of the highlighted portion.</p> <p>-Say, “While the progressions do state that <i>fluent</i> is used to mean ‘fast and accurate’ fluency, ‘involves a mixture of just knowing <i>some</i> answers, knowing some answers from patterns,... and knowing some answers from the use of strategies.’”</p> <p>-Open up for questions and/or discussions</p> <p>-Distribute Basic Facts article during discussion</p>	
 <p>How do we develop mathematical fact fluency?</p> <ul style="list-style-type: none"> • All read and annotate the introduction of <i>Basic Math Facts: A Sequence of Learning</i> (stop at “Phases”) • Work in triads: Each member read one of the Phases (bottom of pp. 1-2) • All read “Key Beliefs” (p.3) 	<p>Background for Facilitator: Read the article to become familiar with the content.</p> <p>Presentation: Annotate your portion, as your triad jigsaws note some ideas from the other two areas. Note: Have the triad share in order of the phases (Phase 1, then 2, then 3). Link will send you to the wcsdcandi website. The “Basic of Math Facts: A Sequence of Learning” is compiled from several sources including The National Council of Teachers of Mathematics, Van de Walle, Doug Clements, Marilyn Burns, and Kathy Fosnot.</p>	
 <p>COMPUTATIONAL PROCEDURES</p>	<p>Background for Facilitator: p.121 in <i>Classroom Discussions in Math</i></p> <p>Presentation:</p>	
 <p>Computational Strategy A method where the numbers in a computation are manipulated in order to create an equivalent but easier computation.</p> <p>Definable features:</p> <ul style="list-style-type: none"> • The steps involved change depending on the specific numbers involved • Offer efficient and accurate ways to compute 	<p>Background for Facilitator: p.121 in <i>Classroom Discussions in Math</i></p>	
 <p>Computational Algorithm A generalized set of steps used to perform computations.</p> <p>Definable features:</p> <ul style="list-style-type: none"> • They are efficient • Produce accurate results • Can be used to perform many computations using the same process 	<p>Background for Facilitator: In the event that the questions get asked regarding what is “the standard algorithm,” Jason Zimba, a leading author of the CCSS-M (NACS), was quoted as saying, “The standard algorithm is the algorithm that works for the student.” (NNMC Mini-Conference 3/8/14)</p> <p>Presentation: Strategies develop into algorithms for efficiency and generalization. “When do we push for moving from strategies to algorithms?”: Our standards dictate when we move our instruction from strategy focus to algorithm.</p>	

	<p>Background For Facilitator:</p> <p>Note 3-6: For 3rd grade teachers who are tempted to look at addition and subtraction: Tier 1 instruction should be focused on grade level standards, therefore they are looking at multiplication and division phases. If addition and subtraction is still a concern, then they should be addressed during intervention/remediation instructional blocks.</p> <p>*These articles are lengthy and it's unlikely that grade levels will finish all of the planning activities during this time. Consider formulating a plan with admin., following up in PLCs, etc. for completion and implementation. Teachers may consider looking at eSuite "Assessment Differentiation Activities" to support these phases.</p> <p>Presentation:</p> <p>Decide as a grade level who will read and share out the individual "Phases" articles for operations in your grade level.</p> <p>K-2: addition and subtraction 3-6: multiplication and division</p> <p>Fill out the note taker with your grade level team.</p>	
	<p>Presentation:</p> <p>"Stop and Jot any changes in thinking or evidence that strengthened your prior thinking in the final column."</p> <p>You may want to consider collecting this document to assess for future coaching needs.</p> <p>Consider:</p> <p>Invite participants to leave a comment on the bottom of document indicating whether they want additional support in computational procedures, classroom discussion, etc.</p>	

Additional Notes:

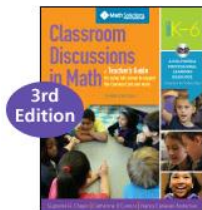
School Level Essential Question:

What strategies can we use to enhance our instruction so students learn mathematics with understanding? What does this look and sound like?

Talk Moves & Strategies

- Turn & Talk
- Think, Pair, Share & Revoice
- Who can add on?
- Revoice/Restate
- Stop & Jot (then revise)

Additional Notes & Support: Chapter 4: Talking About Computational Procedures



- Videos to support:
- 4A Adding Three Numbers (3:19)
 - 4B Subtracting on the Number Line (4:37)
 - 4C Comparing Subtraction Strategies (4:44)
 - 4D Fraction Number Line (6:59)