Unpacked South Dakota State Mathematics Standards

Purpose: *In order for students to have the best chance of success, standards, assessment, curriculum resources, and instruction must be aligned in focus, coherence, and rigor. Unpacked standards documents are intended to help align instruction to the focus, coherence, and rigor of the South Dakota State Mathematics Standards. The standards have been organized in clusters as they are not so much built from topics, but rather woven out of progressions. Not all content in a given grade is emphasized equally in the mathematics standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. To say that some things have greater emphasis is not to say that anything in the standards can safely be neglected in instruction. Neglecting standards will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.*

Domain: Operations and Algebraic Thinking	**Grade Level: 1**
1.OA.C Cluster: Add and subtract within 20 Learners gain and continue to use strategies to solve addition and subtraction problems. When learners repeatedly use strategies that make sense for them, they develop fluency for addition and subtraction within 10. Demonstrating fluency means learners are appropriate, accurate, efficient and flexible when solving problems within 10. Counting on for addition and counting back for subtraction are important strategies for first graders. First graders then apply similar strategies to solve problems within 20, building a foundation for future strategies.	
****This is a MAJOR cluster.** *Students should spend the large majority of their time (65-85%) on the major work of the grade. Supporting work and, where appropriate, additional work should be connected to and engage students in the major work of the grade.* **1.OA.5.** Understand counting on as addition and counting back as subtraction e.g. 5, (6,7,8) means 5 + 3 and 5, (4,3,2) means 5-3. **1.OA.6.** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	

Aspects of Rigor for Student Learning: (Conceptual, Procedural, and/or Application)

Conceptual Understanding	***Procedural Fluency***	***Application***
Know which numbers to begin with and stop at when counting on and counting back. **(1.OA.5)** Number words replace the need for manipulatives when counting. **(1.OA.5)**		
Use the strategies that made sense to them within 10 and extend that understanding to numbers within 20. **(1.OA.6)**	Flexibly, accurately, efficiently and appropriately add and subtract within 10. **(1.OA.6)**	

Enacting the Mathematical Practices - Evidence of Students Engaging in the Practices

1. **Make sense of problems and persevere in solving them.**
    - Solve addition and subtraction equations and word problems

- Make sense of equality
- Conjecture about patterns when decomposing numbers, making tens and adding and subtracting
- Use models, pictures and concrete objects to solve problems

2. **Reason abstractly and quantitatively.**
   - Compare quantities using the equal sign
   - Write equations to solve word problems
   - Flexibly use properties of operations (but do not have to name them)
3. **Construct viable arguments and critique the reasoning of others.**
   - Share conjecture about patterns noticed by students as a foundation for understanding properties of operations
   - Explain reasoning for your solution
   - Listen to others share their solution strategies, trying to understand another way of thinking (possibly trying that strategy on another problem)
4. **Model with mathematics.**
   - Writing equations that represent the action of the word problems
   - Think about whether or not their answer makes sense
   - Be willing to try more than one strategy to solve a problem
5. **Use appropriate tools strategically.**
   - Use tools to make sense of a concept or to solve a problem
   - Think about which tool would work best
   - Try more than one tool if needed
6. **Attend to precision.**
   - Working toward using the equal sign consistently and appropriately
   - Talk to each other about their math ideas using math language
   - Try to be accurate with their problem solving
   - Developing fluency within 10
7. **Look for and make use of structure.**
   - Counting on and counting back
   - Looking for patterns when adding and subtracting
   - Understanding the purpose of the equal sign
8. **Look for and express regularity in repeated reasoning.**
   - Decomposing numbers to make friendlier combinations such as making tens
   - Choosing strategies that work well for them
   - Working on fluency when adding and subtracting within 10

Vertical and Horizontal Coherence and Learning Progressions

Previous Learning Connections	***Current Learning Connections***	***Future Learning Connections***
Kindergarten learners count to 100 and count on from any given number within 100. They are counting back within 20. Learners read and write to 20 and are able to demonstrate one to one when counting objects.**(K.CC.1-3)**	First grade learners are developing fluency (flexibly, accurately, efficiently and appropriately) when adding and subtracting within 10 but continuing to use strategies to solve within 100. The learner may explain their reasoning. **(1.NBT.4)**	Second grade learners fluently add and subtract within 20 using mental strategies. They mentally add two 1-digit numbers. **(2.OA.2)**

Vocabulary *(Key Terms Used by Teachers and Students in this Cluster):*

- Counting on
- Counting back
- Doubling strategy
- Making ten

Relevance, Explanations, and Examples:

Fluently- flexibly, accurately, efficiently and appropriately

NOTE: "Number words replace the need for manipulatives when counting"

- Rather than using manipulatives such as counters, cubes, bears, etc. to help count on or count back, learners begin to visualize numbers/number words as they count to help keep track of their counting.

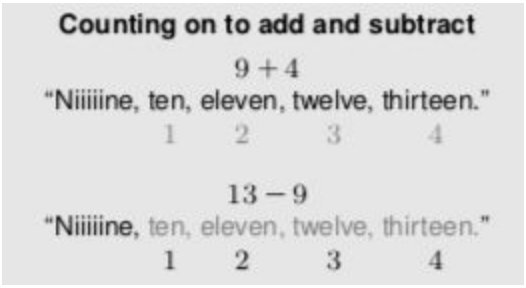
Strategy Examples:

Making ten:

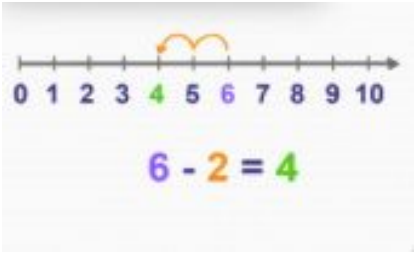
Computing 8 + 6 by making a ten

a. 8's partner to 10 is 2, so decompose 6 as 2 and its partner.
b. 2's partner to 6 is 4.
c. 10 + 4 is 14.

Counting on:



Counting back:



"Siiiiix, five, four"

Doubles Strategy:

$$6+7=6+(6+1)=(6+6)+1=12+1=13.$$

Relationship between addition and subtraction:

$13-9=\square$ is $9+\square=13$