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.A Cluster: Represent and solve problems involving addition and subtraction.

The focus of this cluster is adding and subtracting within 20 and in story problems. Learners will use various strategies and representations to solve with unknowns in all positions.

****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.1. 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.

1.OA.2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

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

Conceptual Understanding	***Procedural Fluency***	***Application***
Understand the relationship between addition and subtraction when solving for unknowns in all positions. **(1.OA.1)**	Extend understanding of addition and subtraction strategies from K to begin solving addition and subtraction equations within twenty by counting on, making tens, using doubles. **(1.OA.1)**	Solve word problems and represent thinking using a strategy that makes sense to them. **(1.OA.1)**
	Recognize that the strategies and patterns that worked to solve problems with two addends (counting on, making ten, using doubles) can help them solve problems with three addends. **(1.OA.2)**	Solve word problems with three addends. **(1.OA.2)**

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 have learned the partners that make 10 for any number and they now know all decompositions for any number below 10. The idea of decomposing numbers (taking apart numbers) lays a foundation for developing strategies based on place value and properties of operations.**(K.OA.3-4)** Learners know all teen numbers as 10 ones and some more.**(K.NBT.1)**	First grade learners are using what they know about making 10 to work with larger numbers and problems with multiple addends. These learners are working to gain confidence and fluency with strategies when solving problems. They are using these skills to answer questions regarding data in a graph. **(1.MD.4)**	Second grade learners are working to become fluent within 100 and to extend their known strategies to larger numbers and two-step word problems. They may apply this skill with problems in a variety of contexts involving length, picture graphs and bar graphs. **(2.OA.1)** **(2.NBT.5)**

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

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

Relevance, Explanations, and Examples:

Decomposing - breaking numbers apart

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 on to add and subtract

$9+4$

"Niiiiine, ten, eleven, twelve, thirteen."

1 2 3 4

$13-9$

"Niiiiine, ten, eleven, twelve, thirteen."

1 2 3 4

Doubling:

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

Relationship between addition and subtraction:

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

NOTE: The *K-5 Progression on Counting and Cardinality and Operations and Algebraic Thinking* provides a chart on page 36 that goes more in depth with these examples.