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: 2**
2.OA.A Cluster: Represent and solve problems involving addition and subtraction. Given a one- or two-step problem-solving situation, learners determine the unknown in all positions using a variety of strategies that make sense to them.		
****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.* ***2.OA.1*** *Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.*		
Aspects of Rigor for Student Learning: (Conceptual, Procedural, and/or Application)		
Conceptual Understanding	***Procedural Fluency***	***Application***
Use equations and diagrams to represent and solve single and multi-step situational problems which involve addition and subtraction **(2.OA.1)**		Use strategies to solve real-world and two-step word problems involving addition and subtraction within 100 **(2.OA.1)** Make up problems and share them for solving
Enacting the Mathematical Practices - Evidence of Students Engaging in the Practices		

1. **Make sense of problems and persevere in solving them.**
    - Visualize what is happening in the problem and how the components are related.
2. **Reason abstractly and quantitatively.**
    - Use numbers and symbols to represent quantities.
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
    - Use pictures, number lines and other representations to model and solve problems.
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
    - Accurately solve the problem.
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

Vertical and Horizontal Coherence and Learning Progressions		
Previous Learning Connections	***Current Learning Connections***	***Future Learning Connections***
Learners have experiences solving all problems types, but are not expected to show mastery. Initially, the meaning of addition is separate from the meaning of subtraction. The problems are limited to numbers within 20 and one-step problems (**1.OA.1**).	Learners build relationships between addition and subtraction. They apply strategies to solve one- and two-step addition/subtraction problems within 100 to length situations (**2.MD.5**, **2.MD.6**) and to problems with bar graphs (**2.MD.10**). As learners develop an understanding of the meaning of operations, they are simultaneously developing their computational fluency (**2.OA.2**).	Learners apply strategies to one and two-step problems involving the four operations (addition, subtraction, multiplication, division). They use a letter to represent an unknown (**3.OA.8**).

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

- Equation
- Operations
- Addition
- Subtraction
- Unknown

Relevance, Explanations, and Examples:

K-2 Common Addition and Subtraction Situations--Addition and Subtraction Problem Types Chart (page 9, South Dakota State Standards for Mathematics)

	RESULT UNKNOWN	**CHANGE UNKNOWN**	**START UNKNOWN**
ADD TO	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 =5
TAKE FROM	Five apples were on the table. I ate two apples. How many apples are on the table now?5-2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before?? - 2 = 3
	TOTAL UNKNOWN	**ADDEND UNKNOWN**	**BOTH ADDENDS UNKNOWN**2

PUT TOGETHER / TAKE APART[3]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5-3 = ?	Grandma has five flowers. How many can she put in the red vase and how many in her blue vase? 5 = 0 + 5, 5 + 0 5 = 1 +4, 5 = 4 +1, 5 = 2 + 3, 5 = 3 + 2
COMPARE	**DIFFERENCE UNKNOWN**	**BIGGER UNKNOWN**	**SMALLER UNKNOWN**
	(“How many more?” version):Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?(“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have then Julie? 2 + ? = 5, 5 – 2 = ?	(Version with “more”): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with “more”):Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have?(Version with “fewer”): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

1 Adapted from Box 2-4 of Mathematics Learning in Early Childhood, National Research Council (2009, pp. 32, 33).
2 These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean, makes or results in but always does mean is the same number as.
3 Either addend can be unknown, so there are three variations of these problem situations. Both addends Unknown is a productive extension of the basic situation, especially for small numbers less than or equal to 10.
4 For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.