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.D Cluster: Work with addition and subtraction equations

The focus of this cluster is gaining an understanding of equality. Learners use what they understand about the equal sign to solve equations 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.7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.

1.OA.8. Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 +? = 11, 5 = ? – 3, 6 + 6 = ? .

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

Conceptual Understanding	***Procedural Fluency***	***Application***
Understand that the equal sign (=) means “same as” Understand that the equal sign can be located anywhere in the equation Understand the meaning of true and false and use this language to categorize equations. This helps learners express their ideas and to uncover misconceptions about equality **(1.OA.7)**		
	Making addition and subtraction equations true by naming the unknown (in any position) (**1.OA.8)**	

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 are comparing number of objects in one group to the number of objects in another group to decide if they are equal. They also compare two written numbers between 1 and 10 and discuss if they are equal. **(K.CC.6-7)**	First grade learners develop an understanding of the equal sign to help them better solve addition and subtraction equations. Because learners are changing the structure of problems (ie. changing subtraction problem to an addition problem) they need to be flexible with the position of unknowns and the location of the equal sign in equations. (ie. 5+4=9 or 9= 5 + 4)	Second grade learners are writing equations to express equivalent groups and the ideas of even numbers, equal parts, skip counting, etc. They also write equations to solve word problems. Learners are thinking about inequalities and continue to use their understanding of the equal sign. **(2.OA.3)**

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

- Unknown
- Equal - “same as”
- Equal sign
- True
- False

Relevance, Explanations, and Examples:

NOTE: For a visual representation, a balance scale can be used to help teach the concept of the equal sign meaning the "same as" on both sides.

NOTE: When stating if an equation is true or false, it is typical at first for learners to want to compare the equations themselves, the numbers in the equations, or the action required (adding or subtracting), rather than comparing the answers they get on both sides of the equal sign.

NOTE: When solving equations with unknowns in all positions, you may refer to the "start, change, result" model.

Result Unknown	Change Unknown	Start Unknown
A bunnies sat on the grass. B more bunnies hopped there. How many bunnies are on the grass now? $A + B = \square$	A bunnies were sitting on the grass. Some more bunnies hopped there. Then there were C bunnies. How many bunnies hopped over to the first A bunnies? $A + \square = C$	Some bunnies were sitting on the grass. B more bunnies hopped there. Then there were C bunnies. How many bunnies were on the grass before? $\square + B = C$
C apples were on the table. I ate B apples. How many apples are on the table now? $C - B = \square$	C apples were on the table. I ate some apples. Then there were A apples. How many apples did I eat? $C - \square = A$	Some apples were on the table. I ate B apples. Then there were A apples. How many apples were on the table before? $\square - B = A$