

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: Kindergarten
<p>K.OA.A Cluster: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</p> <p>Students build upon their understanding of counting to develop meaning for addition and subtraction through modeling and representing problem situations, using concrete objects and representations. This domain/cluster comprises the major work of kindergarten and will be developed throughout the entire school year.</p>		
<p>**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.</p>		
<p>K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem.)</p>		
<p>K.OA.2 Solve addition and subtraction word problems.</p> <ul style="list-style-type: none"> a. Solve addition and subtraction word problems (within 10), involving result unknown problems, put together/take apart total unknown, and put together/take apart addend unknown, e.g., using objects or drawings to represent the problem. (see appendix for K-2 Common Addition and Subtraction Situations) b. Add and subtract within 10, eg., by using objects or drawings to represent the problem. 		
<p>K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).</p>		
<p>K.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.</p>		
<p>K.OA.5 Fluently add and subtract within 5.</p>		
<p>Aspects of Rigor for Student Learning: (Conceptual, Procedural, and/or Application)</p>		
Conceptual Understanding	Procedural Fluency	Application
<p>Model, verbally and non-verbally, addition (compose / put together) and subtraction (decompose / take apart) in a variety of experiences (K.OA.1)</p> <p>Teacher Note: Teachers will introduce expressions (3-1) and equations (3-1=2) that</p>		

represent addition and subtraction. (K.OA.1)		
	Solve various types of addition and subtraction problems, including word problems, using objects or drawings (within 10) (K.OA.2.a,b) *See example 1 or page 9 of the SD State Standards for Mathematics for addition and subtraction problem type examples. (K.OA.2.a,b)	Apply addition and subtraction to various real world problems (K.OA.2.a,b)
Understand that numbers, within 10, can be put together and taken apart in different ways and be recorded using equations or drawings. (K.OA.3) *See example 2 Teacher Note: While equations can be used by the teacher and the students it is not a skill that is required by Kindergarten students.		
Find the missing addend that makes 10 when given a number 1-9 (K.OA.4) *See example 3		
	Accurately, efficiently, flexibly and appropriately add and subtract numbers within 5. (K.OA.5) *See example 4 below or page 8 of the South Dakota State Standards for definition of fluency. (K.OA.5)	

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

- 1. Make sense of problems and persevere in solving them.**
 - Solve problems using objects and drawings
 - Understand the approaches of others and identify correspondence
- 2. Reason abstractly and quantitatively.**
 - Describe their models and explain their thinking/reasoning with emphasis on appropriate addition and subtraction terminology
- 3. Construct viable arguments and critique the reasoning of others.**
 - Students explain their conclusions to others
- 4. Model with mathematics.**
 - Use concrete materials to model how numbers are composed and decomposed
 - Connect physical representations to drawings
- 5. Use appropriate tools strategically.**
 - Use concrete objects to show ways numbers can be composed and decomposed
- 6. Attend to precision.**
 - Accurately, efficiently, flexibly and appropriately add and subtract

-Working toward using the equal sign consistently and appropriately

7. Look for and make use of structure.

-Finding patterns as students compose and decompose numbers

8. Look for and express regularity in repeated reasoning.

-Extend initial work and apply to numbers through 19

Vertical and Horizontal Coherence and Learning Progressions

<u>Previous Learning Connections</u>	<u>Current Learning Connections</u>	<u>Future Learning Connections</u>
	Kindergarten learners decompose larger numbers in the range of 11-19 to gain foundations for place value by composing and decomposing into “ten ones and some more.” (eg., 18 is ten ones and eight more) (K.NBT.1)	<p>These understandings developed in kindergarten will support the following learning in first grade:</p> <p>Represent and solve problems with addition and subtraction within 20 including a new type of problem situation (Compare)</p> <p>Understand and apply properties of operations and the relationship between addition and subtraction Work with addition and subtraction equations</p>

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

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> ● Add ● Addition ● Put together ● Plus ● Subtract | <ul style="list-style-type: none"> ● Subtraction ● Take apart ● Minus ● Equation ● Equal | <ul style="list-style-type: none"> ● Total ● Five frame ● Ten frame ● Same as |
|---|---|---|

Relevance, Explanations, and Examples:

Example 1

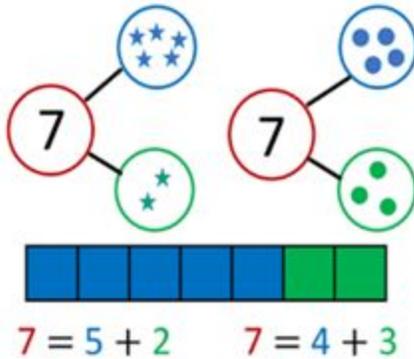
Table 1: Addition and subtraction situations

	Result Unknown	Change Unknown	Start Unknown
Add To	<p><i>A</i> bunnies sat on the grass. <i>B</i> more bunnies hopped there. How many bunnies are on the grass now?</p> $A + B = \square$	<p><i>A</i> bunnies were sitting on the grass. Some more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies hopped over to the first <i>A</i> bunnies?</p> $A + \square = C$	<p>Some bunnies were sitting on the grass. <i>B</i> more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies were on the grass before?</p> $\square + B = C$
Take From	<p><i>C</i> apples were on the table. I ate <i>B</i> apples. How many apples are on the table now?</p> $C - B = \square$	<p><i>C</i> apples were on the table. I ate some apples. Then there were <i>A</i> apples. How many apples did I eat?</p> $C - \square = A$	<p>Some apples were on the table. I ate <i>B</i> apples. Then there were <i>A</i> apples. How many apples were on the table before?</p> $\square - B = A$
Put Together / Take Apart	<p>Total Unknown</p> <p><i>A</i> red apples and <i>B</i> green apples are on the table. How many apples are on the table?</p> $A + B = \square$	<p>Both Addends Unknown¹</p> <p>Grandma has <i>C</i> flowers. How many can she put in her red vase and how many in her blue vase?</p> $C = \square + \square$	<p>Addend Unknown²</p> <p><i>C</i> apples are on the table. <i>A</i> are red and the rest are green. How many apples are green?</p> $A + \square = C$ $C - A = \square$

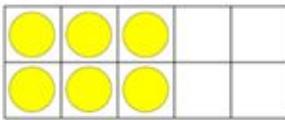
Example 2

Tommy Tiger is missing seven buttons on his jacket. How many ways can you use blue and green buttons to finish his jacket.

Draw a picture of all ideas - students can compose: 6 blue and 1 green button; 5 blue and 2 green buttons; 4 blue and 3 green buttons; or 7 blue and 0 green buttons.

**Example 3**

A case of juice boxes contains 10 boxes. There are 6 juice boxes left in the case. How many juice boxes have been taken out of the case?"



Students found the missing addend of 4 using a ten frame or linking cubes. Other options including but not limited to are beans, 2 colored counters, drawing a picture, sticking dots, or applying known facts.

Example 4

Fluency - skill in carrying out procedures flexibly, accurately, efficiently and appropriately.