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: Number and Operation in Base Ten		**Grade Level: 3rd**
3.NBT.A Cluster: Use place value understanding and properties of operation to perform multi-digit arithmetic. A range of algorithms may be used.		
****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.* **3.NBT.1**. Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.2**. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **3.NBT.3**. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.		
Aspects of Rigor for Student Learning: (Conceptual, Procedural, and/or Application)		
Conceptual Understanding	***Procedural Fluency***	***Application***
Learners will round 2 or 3 digit numbers to the nearest 10 or 100 within a 1000. **(3.NBT.1)** Learners will determine the nearest 10 or 100 a number is closest to and explain their reasoning. **(3.NBT.1)**		
	Learners will use a variety of models and strategies to solve addition and subtractions problems. **(3.NBT.2)** Learners will write equations vertically and horizontally. **(3.NBT.2)** Learners will use algorithm of choice to solve addition and subtraction problems within 1000. **(3.NBT.2)**	
Learners understand the meaning of multiplication to model examples of multiplying a one-digit number by 10. **(3.NBT.3)**	Learners multiply one-digit numbers by multiples of 10 and be able to discuss patterns and make generalizations. **(3.NBT.3)**	

Learners model multiplication of a one-digit number by a multiple of 10 (10 to 90) using concrete models, number lines, skip counting and distributive property. **(3.NBT.3)**		

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

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
    - Students use representation to model and explain their thinking within 1000.
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
    - Students use representations, including number lines, show groups of tens and groups of one hundred, to model and explain their thinking.
6. **Attend to precision.**
    - Students continue to develop appropriate vocabulary and use that vocabulary in their explanation.
7. **Look for and make use of structure.**
    - Students use the structure of place value (composing and decomposing tens and hundreds) to develop efficient strategies to add and subtract.
    - Students explore and discuss the structure of multiplication by using models to see what happens when multiplying by multiples of 10.
8. **Look for and express regularity in repeated reasoning.**
    - Students generalize that when multiplying by 10, for example 3 x 10, they have three 10's, which is written as 30.
    - Students recognize this pattern and why it works rather than being given a shortcut to avoid other misconceptions.
    - Students extend this understanding to all multiples of 10, making generalizations to find efficient ways to multiply.

Vertical and Horizontal Coherence and Learning Progressions

Previous Learning Connections	***Current Learning Connections***	***Future Learning Connections***
In 2nd grade, learners used place value understanding and properties of operations to add and subtract. Learners understood that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases. **(2.NBT.1**) Learners added and subtracted within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. (**2.NBT.7)** Learners explained why addition and subtraction strategies work, using place value and the properties of	**In 3rd grade, learners extend their knowledge of place value to include rounding numbers.** ** Standards have been listed in this column to show progression of learning and how instruction correlates (a mutual relationship or connection, in which one thing affects or depends on another.) with the focus standard which is boldfaced.* Learners use place value understanding to round whole numbers to the nearest 10 or 100. **(3.NBT.1)** Learners fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **(3.NBT.2)**	In 4th grade, learners will use place value understanding and properties of operations to perform multi-digit arithmetic. Learners use place value understanding to round multi-digit whole numbers to any place. **(4.NBT.3)** Learners fluently add and subtract multi-digit whole numbers using the standard algorithm. **(4.NBT.4)** Learners multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **(4.NBT.5)**

<table>
<tr>
<td>operations. (2.NBT.9)

Learners mentally added 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. (2.NBT.8)</td>
<td>Learners apply properties of operations as strategies to multiply and divide.2 (3.OA.5)

Learners relate area to the operations of multiplication and addition. (3.MD.7)

Learners will multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. (3.NBT.3)</td>
<td>Learners find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (4.NBT.6)</td>
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<tr>
<td colspan="3">Vocabulary (Key Terms Used by Teachers and Students in this Cluster):</td>
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<tr>
<td>

Area model
Expanded form
Algorithm
Standard form
Written form

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<td>

Benchmark (landmark numbers)
Compare
Place value
Estimate
Round

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<td>

Multiples
Factor
Product
digit

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<tr>
<td colspan="3">Relevance, Explanations, and Examples:</td>
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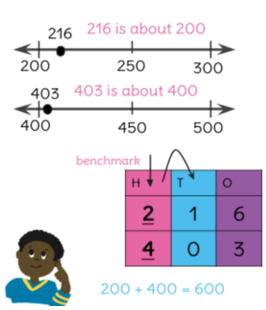
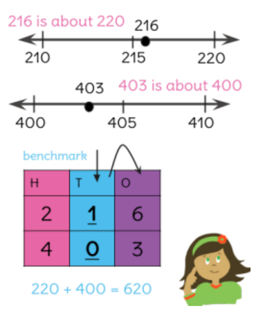
<tr>
<td colspan="3">Rounding





Multiples of Ten (see next page)</td>
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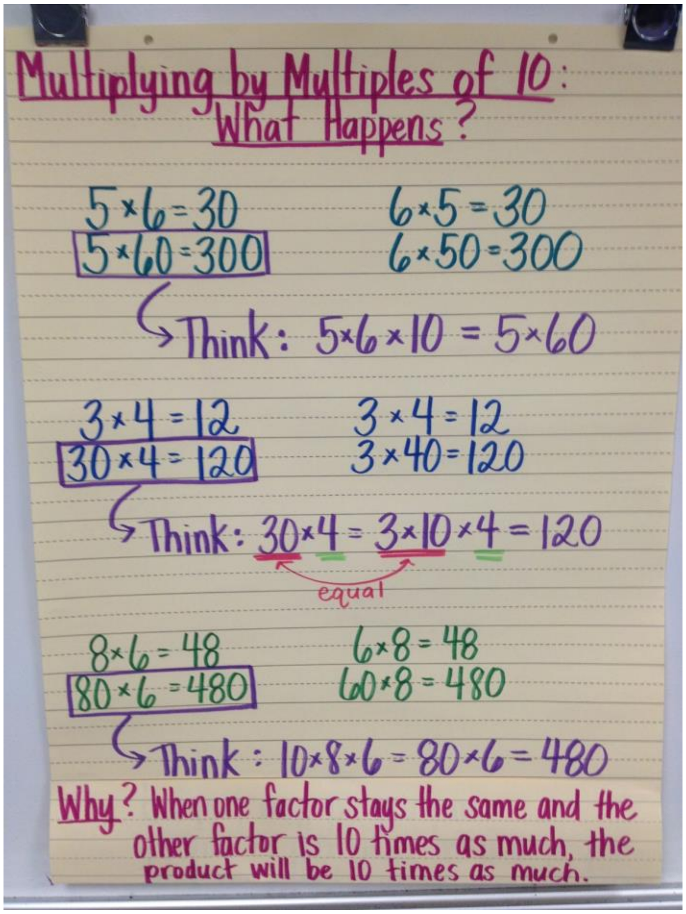

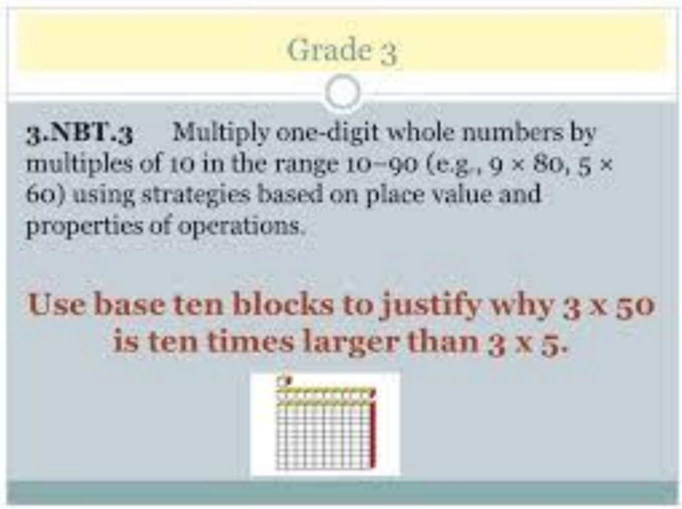

Achievement Level Descriptors	
Cluster: **Use place value understanding and properties of operation to perform multi-digit arithmetic (A range of algorithms may be used)**	
Concepts and Procedures	**Level 1** students should be able to add and subtract within 100, using strategies and algorithms based on place value understanding. They should be able to round two-digit whole numbers to the nearest 10.
	Level 2 students should be able to add and subtract within 1,000, using strategies and algorithms based on the relationship between addition and subtraction. They should be able to round whole numbers to the nearest 100 and multiply one-digit whole numbers by multiples of 10 in the range of 10–90.
	Level 3 students should be able to fluently add and subtract within 1,000, using strategies or algorithms based on place value understanding, properties of arithmetic, and/or the relationship between addition and subtraction.
	Level 4 students should be able to use multiple strategies to fluently add and subtract within 1,000.