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.*

<table>
<tr><td colspan="2">Domain: Numbers and Operations - Fractions</td><td>Grade Level: 4</td></tr>
<tr><td colspan="3">4.NF.C Cluster: Understand decimal notation for fractions, and compare decimal fractions

This cluster continues to work on fractions, making explicit connections to fractions with tenths and hundredths. Decimal notation is used to build an understanding of tenths and hundreds and extends the place value system to numbers less than 1. They compare decimals using physical models, such as base-ten blocks and the number line.</td></tr>
<tr><td colspan="3">**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.

4.NF.5 - Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.

4.NF.6 - Read and write decimal notation for fractions with denominators 10 or 100. Locate these decimals on a number line.

4.NF.7 - Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, <, or =, and justify the conclusions.</td></tr>
<tr><td colspan="3">Aspects of Rigor: (Conceptual, Procedural, and/or Application)</td></tr>
<tr><td>Conceptual Understanding</td><td>Procedural Fluency</td><td>Application</td></tr>
<tr><td>Understand how a fraction with a denominator of 10 is equal to a fraction with a denominator of 100. (4.NF.5)</td><td>Change a fraction with a denominator of 10 to an equivalent fraction with a denominator of 100. (4.NF.5)

Add two fractions with denominators of 10 or 100. (4.NF.5)</td><td></td></tr>
<tr><td>Understand fractions with denominators of 10 or 100 can be written as decimals. (4.NF.6)</td><td>Read and write a fraction with denominators of 10 or 100 as decimals. (4.NF.6)

Locate decimals on a number line. (4.NF.6)</td><td></td></tr>
<tr><td>Reason about the size of two decimals to the hundredths place. (4.NF.7)</td><td>Use symbols (>, <, or =) when comparing decimals. (4.NF.7)</td><td></td></tr>
</table>

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.**
3. **Construct viable arguments and critique the reasoning of others.**
   - Compare the size of two decimals and justify the reason for the larger decimal.
4. **Model with mathematics.**
   - Model using grids, base-ten blocks and a number line.
5. **Use appropriate tools strategically.**
   - Use base-ten blocks and a number line to model equivalent fractions and decimal notation on a number line diagram.
6. **Attend to precision.**
   - Find and share examples of where decimals are used in everyday life.
7. **Look for and make use of structure.**
   - Write fractions as decimals using the previous knowledge of place value structure.
8. **Look for and express regularity in repeated reasoning.**
   - Explain the value of tenths and hundredths as related to the ones place and one whole.

Vertical and Horizontal Coherence and Learning Progressions

Previous Learning Connections	***Current Learning Connections***	***Future Learning Connections***
Explain equivalence and generate equivalent fractions **(3.NF.3)** Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones **(2.NBT.1)** Compare two fractions with the same numerator or the same denominator by reasoning about their size **(3.NF.3d)** Compare two three-digit numbers **(2.NBT.4)**	Equivalent fractions **(4.NF.1)** Add and subtract fractions with like denominators **(4.NF.3)** Solve measurement word problems involving decimals **(4.MD.2)** Read, write, and compare multi-digit whole numbers **(4.NBT.2)** Compare fractions with different numerators and denominators **(4.NF.2)**	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left **(5.NBT.1)** Add, subtract, multiply and divide decimals **(5.NBT.7)** Read, write, and compare decimals to thousandths **(5.NBT.3)**

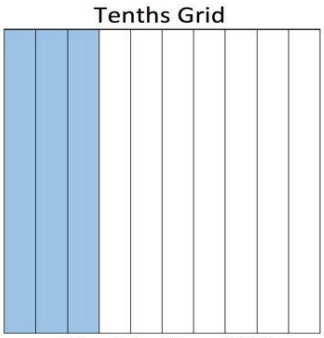
Vocabulary *(Key Terms Used by Teachers and Students in this Cluster):*

- Fraction
- Numerator
- Denominator
- Equivalent
- Reasoning
- Decimals
- Tenths
- Hundredths
- Multiplication
- Comparisons/compare
- ‹, ›, =

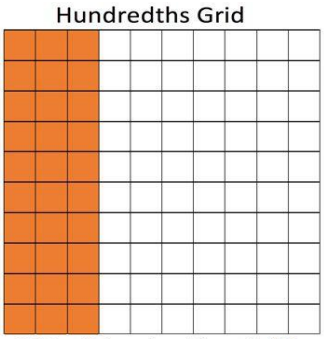
Relevance, Explanations, and Examples:

Teacher Note: Learners are first exposed to decimals in fourth grade.

4.NF.5



0.3 = 3 tenths = 3/10

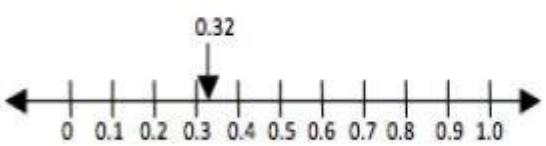


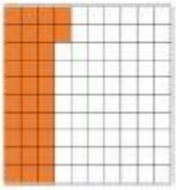
0.30 = 3 hundredths = 3/10

3/10 + 4/100 = 30/100 + 4/100 = 34/100

4.NF.6

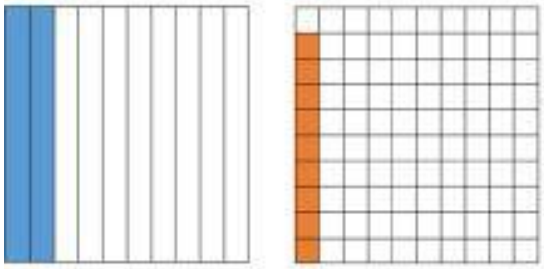
Hundreds	Tens	Ones	•	Tenths	Hundredths
			•	3	2





4.NF.7

Seeing that 0.2 > 0.09 using a visual fraction model



The shaded region on the left shows 0.2 of the unit square, since it is two parts when the square is divided into 10 parts of equal area. The shaded region on the right shows 0.09 of the unit square, since it is 9 parts when the unit is divided into 100 parts of equal area.

Achievement Level Descriptors	
Cluster: **Understand decimal notation for fractions, and compare decimal fractions**	
Concepts and Procedures	***Level 1:***
	Level 2: Students should be able to express a fraction with denominator 10 as an equivalent fraction with denominator 100 and express those fractions as decimals.

	Level 3: Students should be able to add two fractions with respective denominators 10 and 100 by first converting to two fractions with like denominators; compare two decimals to the hundredths using >, <, =, or on a number line; and compare decimals by reasoning about their size.
	Level 4: Students should be able to compare two decimals to the hundredths using <, >, and = and justify the conclusions by using visual models.