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: Measurement and Data		**Grade Level: 4**
4.MD.B Cluster: Represent and interpret data This cluster focuses on creating line plots to display a set of data measured in fractional units ½, ¼, and ⅛. Learners will solve problems using the data from the line plot.		
****This is a SUPPORTING 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.MD.4 - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.		
Aspects of Rigor: (Conceptual, Procedural, and/or Application)		
Conceptual Understanding	***Procedural Fluency***	***Application***
	Make a line plot to display a set of data including fractions **(4.MD.4)**	Solve problems involving addition and subtraction of fractions by using information presented in line plots **(4.MD.4)**
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.** ● Attend to the meaning of the measured objects and plots on the number line 3. **Construct viable arguments and critique the reasoning of others.** 4. **Model with mathematics.** ● Use line plots to display data of objects measured in fractional units 5. **Use appropriate tools strategically.** ● Use a ruler to measure objects to the nearest ⅛, ¼, and ½ inch. 6. **Attend to precision.** ● Attend to precision with specific vocabulary to describe and analyze data of objects measured and display on line plots 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***
Generate measurement data by measuring lengths using rulers	Use the four operations to solve word problems, including simple fractions	Make line plots with measurements to the half, quarter, and eighth of a unit.

marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units-whole numbers, halves, or quarters **(3.MD.4)** Understand line plots represent measurement data, not categorical data **(3.MD.3) (3.MD.4)** Generate measurement data and make line plots using whole number units **(2.MD.9)**	and represent measurement quantities using diagrams **(4.MD.2)** Explain why fractions are equivalent and generate equivalent fractions **(4.NF.1)** Add and subtract mixed numbers with like denominators **(4.NF.3c)**	Solve problems involving operations of fractions.**(5.MD.2)** Solve real world problems involving the addition and subtraction of fractions referring to the same whole, including cases of unlike denominators **(5.NF.2)**

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

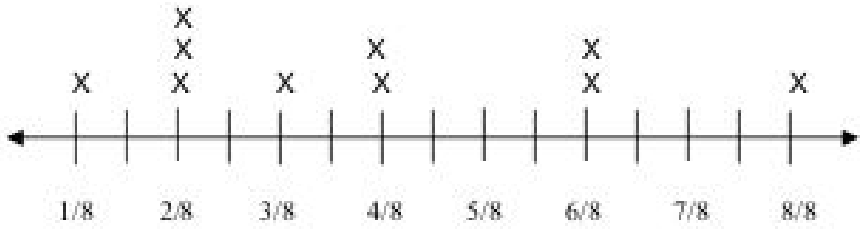
- Fraction
- Line plot
- Measure

Relevance, Explanations, and Examples:

At a butterfly farm they have various caterpillars measuring at different lengths. Create a line plot to show the lengths of each caterpillars.
Length of caterpillars (in inches)
1/6 3/6 5/6 1/6 2/6 1/6 3/6 1/6 5/6

The use of line plots will support learners understanding of equivalent fractions and comparing fractions:

Example:
Students measured objects in their desk to the nearest 1/2, 1/4, or 1/8 inch. They displayed their data collected on a line plot. How many objects measured 1/4 inch? 1/2 inch? If you put all the objects together end to end what would be the total length of all the objects.



Achievement Level Descriptors

Cluster: **Represent and interpret data**

Concepts and Procedures	***Level 1:*** Students should be able to identify data from a given line plot using whole numbers.
	Level 2: Students should be able to use data from a given line plot using fractions 1/2, 1/4, and 1/8 to solve one-step problems.
	Level 3: Students should be able to create a line plot to represent a data set using fractions 1/2, 1/4, and 1/8 and interpret data from a line plot to solve

	problems involving addition and subtraction of fractions with like denominators.
	Level 4: