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: 5**

5.MD.B Cluster: Represent and interpret data.

Students will solve addition, subtraction, multiplication, and division problems based on data with fractions from a line plot and will redistribute unequal distribution of data into equal groups.

****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.*

5.MD.2 Make a line plot to display a data set.

- **a.** Use operations on fractions of a unit (1/2, 1/4, 1/8) for this grade to solve problems involving information presented in line plots.
- **b.** Use information from a line plot representing an unequal situation and redistribute whole or fractional parts to create an equal distribution. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

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

Conceptual Understanding	***Procedural Fluency***	***Application***
Understand how to equally distribute a whole or fractional parts. **(5.MD.2.b)**[1, 2]	Create line plots using fractional data. Solve problems using fractional data from the line plot. **(5.MD.2.a)**	

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

1. **Make sense of problems and persevere in solving them.**
   - Students will interpret and make sense of data involving information presented in line plots.[3]
2. **Reason abstractly and quantitatively.**
   - Students will attend to the meaning of the measured objects on line plots and will use operations involving fractions.
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
   - Students will use line plots to display data of objects measured in fractional units.
5. **Use appropriate tools strategically.**
   - While it is not required in the standard for students to generate their own data, students could use measurement tools (to the nearest ⅛,¼, and ½) to create data for their line plot.
6. **Attend to precision.**
   - Students will attend to precision with specific vocabulary to describe and analyze data of objects measured and displayed 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***
In 3rd grade, students generate data by measuring lengths and make line plots using that data. **(3.MD.4)** They continue this work in 4th grade by solving addition and subtraction problems using the data on the line plot. **(4.MD.4)**	Students grow in their skill and understanding of fraction arithmetic. **(5.NF)** Students use these skills to solve problems, including problems that arise from analyzing line plots.	In 6th grade, students will display numerical data in plots on number lines, dot plots, histograms, and box plots. They will be required to choose the most appropriate graph/plot for the data. **(6.SP.4)**

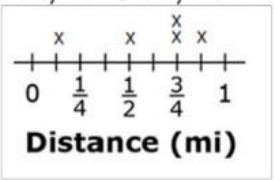
Vocabulary *(Key Terms Used by Teachers and Students in this Cluster):*

- line plot
- data set

Relevance, Explanations, and Examples:

1

Jonah recorded the distance, in miles, that he ran each day for 5 days on the line plot shown.



Enter the total distance, in miles, that Jonah ran all 5 days.

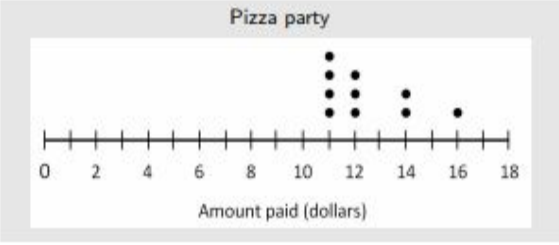
Answer Key
3, 24/8, or equivalent

Jonah wants to run the same distance equally over 5 days. What fraction of a mile would Jonah run each day?

2

Ten students decide to have a pizza party and each is asked to bring his or her favorite pizza. The amount paid (in dollars) for each pizza is shown in the plot to the right.

Each of the ten is asked to contribute an equal amount (his or her fair share) to the cost of the pizza. Where does that fair share amount lie on the plot? Is it closer to the smaller values or the large one? Now, two more students show up for the party and they have contributed no pizza. Plot their values on the graph and calculate a new fair share. Where does it lie on the plot? How many more students without pizza would have to show up to bring the fair share cost below $8.00?



Achievement Level Descriptors	
Cluster: Represent and interpret data.	
Concepts and Procedures	***Level 1:*** Students should be able to make a line plot and represent data sets in whole units.
	Level 2: Students should be able to make a line plot and display data sets in fractions of a unit (1/2, 1/4, 1/8).
	Level 3: Students should be able to interpret a line plot to display data sets in fractions of a unit (1/2, 1/4, 1/8) and solve problems using information from line plots that require addition, subtraction, and multiplication of fractions.
	Level 4: