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: 3**

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

Students will construct bar graphs, picture graphs and line plots. This information will be used to solve one- and two-step word problems to the nearest whole, half and fourth.

****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.*

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

3.MD.4. Generate measurement data by measuring lengths using rulers 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.

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

Conceptual Understanding	***Procedural Fluency***	***Application***
Learners will understand how to represent the data on a scaled picture graph and scaled bar graph with several categories. **(3.MD.3)**	Learners will draw scaled picture graph and scaled bar graphs to represent the data set using several categories.**(3.MD.3**)	Learners will solve one-and two-step "how many more" and "how many less" word problems. **(3.MD.3)**
Learners will understand how to use a ruler to measure to the nearest whole, half and fourths of the fractional measurement. **(3.MD.4)**	Learners will make a line plot using a horizontal scale representing wholes, halves and fourths of the fractional measurement. **(3.MD.4)**	

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

1. **Make sense of problems and persevere in solving them.**
    - Students will solve one- and two-step problems using information presented in the graphs.
    - Students will solve one- and two-step problems using information presented in the graph.
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
    - Students will apply addition and subtraction to solve problems with graphs.
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
    - Students will attend to precision with appropriate vocabulary to describe bar graphs, picture graphs, and line plots.
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

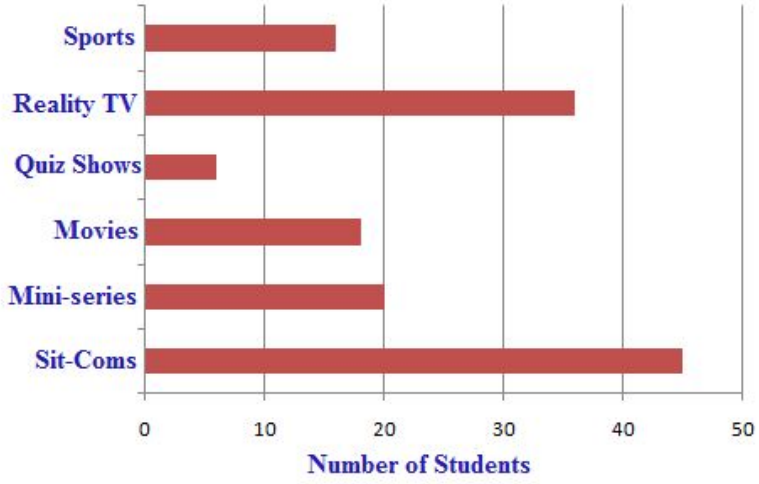
Vertical and Horizontal Coherence and Learning Progressions		
Previous Learning Connections	***Current Learning Connections***	***Future Learning Connections***
In 2nd grade, learners have had adequate practice measuring objects and inputting data on picture and bar graphs to represent data. They have answered questions relating and comparing the data represented on the graphs. Learners drew a picture graph and a bar graph (with single-unit scale) to represented a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. **(2.MD.10)**	**In 3rd grade, learners will represent and interpret data found on a scaled picture graph, bar graph and line plots. They will generate measurement data and put it on a line plot.** ** 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 draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. **(3.MD.3)** Learners solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. **(3.OA.8)** Learners understand a fraction as a number on the number line; represent fractions on a number line diagram. **(3.NF.2)** Learners generate measurement data by measuring lengths using rulers 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)**	In 4th grade, learners will understand unit fractions measurements, represent and interpret data found on a line plot. They will add and subtract to solve problems about the data. Learners 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. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection. **(4.MD.4)** Learners understand a fraction a/b with a > 1 as a sum of fractions 1/b. **(4.NF.3)**

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

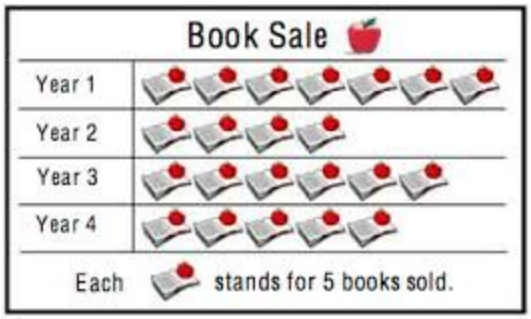
- Graph
  - Scaled Bar Graph
  - Scaled Picture Graph
  - Line Plot
  - Data
  - Horizontal Scale
- Ruler
  - Halves, Fourths (quarters)

Relevance, Explanations, and Examples:

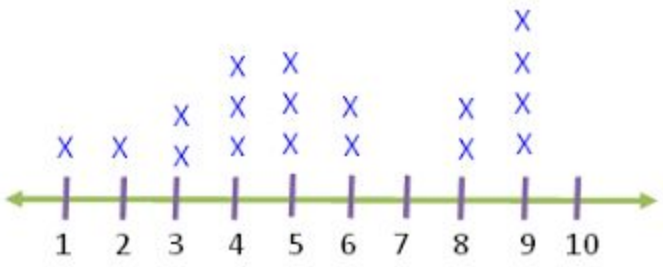
Horizontal Scaled Bar Graph



Horizontal Scaled Picture Graph



Line Plot



Ruler in halves and quarters (¼)

Achievement Level Descriptors	
Cluster: **Represent and interpret data.**	
Concepts and Procedures	**Level 1** Students should be able to draw a picture graph and a bar graph to represent a data set with up to four categories; generate measurement data by measuring length using rulers marked with one-inch intervals; and create a line plot to represent a data set where the horizontal scale is marked in whole unit intervals.
	Level 2 Students should be able to solve one-step "how many more?" and "how many less?" problems using information presented in picture and bar graphs; generate measurement data by measuring lengths using rulers marked with half-inch intervals; and represent measurement data on a line plot with a horizontal scale marked in half-unit intervals.
	Level 3 Students should be able to draw a scaled picture graph and a scaled bar graph to represent a data set; solve two-step "how many more?" and "how many less?" problems using information presented in a scaled bar graph; generate measurement data by measuring length using rulers marked with quarter-inch intervals; and create a line plot with a horizontal scale marked in quarter-unit intervals.
	Level 4: