Data Progressions K-5

The k-5 data standards run along two paths. One path deals with categorical data (sorting objects into categories) and focuses on bar graphs as a way to represent and analyze such data. The other path deals with measurement data (from taking measurements). Measurement data can be displayed on a line plot, including a number line diagram as the scale. In students' work with data, context is important and provides meaning. Data are not just numbers, they are numbers with a context.

	Categorical Data	Measurement Data

K	• Classify objects into given categories
	  ○ Sort collections in more than one way, e.g. buttons can be sorted by size and then again by color
	  ○ Use descriptive words to describe how their collections have been sorted
	  ○ Sort by given attributes at first, then be able to select specified attributes
	• Count the number of objects in each category and sort (order) the categories by count
	  ○ Category counts can be less than or equal to 10
	  ○ Connect counting and comparing goals to tell the number of objects (**see Number Sense progressions**)
		• Describe and directly compare measurable attributes (**see Measurement progressions**)

1	• Organize and represent categorical data
	  ○ Think about questions to pose and limit the responses to three top categories
	  ○ Create a table or chart to use to record/represent data
	  ○ Collect data by asking other students for responses
	• Ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another
	  ○ Analyze and interpret data both verbally and in writing
	  ○ Use comparison vocabulary such as more than, less than, most, and least in analyzing data
	  ○ Connect to solving addition and subtraction problems (**see Addition & Subtraction progressions**)
		• Order and compare three objects by length (**see Measurement progressions**)
		• Express the length of objects as a whole number of unit lengths (**see Measurement progressions**)

2	• Draw graphs (with single-unit scales) to represent a data set with up to four categories
	  ○ Draw picture graphs and bar graphs (bar graphs may be horizontal or vertical)
	  ○ Generate interesting questions to pose to classmates for data collection
	  ○ Choose categories and collect data
	  ○ Work with given categorical data sets to create graphs
	  ○ Create scales with equal intervals (grid paper may be helpful)
	• Solve simple put-together, take-apart, and compare problems using information presented in a bar graph
	  ○ Prepare to share a summary of the data, including conclusions, comparisons, and generalizations
		• Generate their own measurement data by measuring lengths of several objects to the nearest whole unit (inch, foot, centimeter, or meter)
		  ○ Select and use the appropriate tool or by making repeated measurements of the same object (iterating) (**see Measurement progressions**)
		• Show measurements by making a line plot
		  ○ Horizontal scale is marked off in whole-number units of the measurement lengths
		  ○ Share the data on the line plot they create
		  ○ Ensure X's marked on line plots are drawn equally, in correct positions and spaced/stacked equally
		  ○ Use provided data sets to generate line plots

3	• Draw scaled graphs to represent a data set with several (six or fewer) categories
	  ○ Pictographs and bar graphs
	  ○ Collect and categorize data to display graphically
		• Measure objects to the nearest whole, half, and quarter of an inch **(see Measurement progressions**)
		• Create a line plot to display generated measurement data
		  ○ Horizontal scale is marked off in appropriate units

	○ Students recognize and determine scale of graphs, e.g. for categories with 7, 8, and 6 items in each, would a scale of 2 units or 5 units be most appropriate? ○ Connect the use of multiplication to determine scale and key intervals • Solve one and two step problems using information from graphs ○ Involving "how many more" and "how many less" problems	○ Connect horizontal scale to work with fractions on a number line
4		• Create line plots to show a data set of objects with fractional length measurements of 1/2, 1/4, and 1/8 ○ Students work with line plot scales and/or data that may include only one denominator, especially when working with addition and subtraction problem solving, e.g. data set may include measures of 5/8 in., 3/8 in., 4/8 in., 8/8 in., 5/8 in., 2/8 in., 4/8 in., and 5/8 in. • Solve simple word problems involving addition and subtraction of the fractions found in their line plots ○ Connect to adding and subtracting of fractions with **like denominators**, e.g. what is the difference between the longest measure (1 7/8 in.) and shortest measure (5/8 in.)?
5		• Create line plots to show a data set of objects with fractional measurements of 1/2, 1/4, and 1/8 ○ Measure objects to the nearest 1/8 of a unit, including length, mass, and liquid volume ○ Construct a line plot with information gathered, or from given data sets ○ Display, analyze, and interpret their own line plots • Solve word problems involving the four operations on the fractions found in their line plots ○ Connect to adding and subtracting of fractions with **unlike denominators**, and grade level appropriate work with multiplication and division of fractions (**see Fraction progressions**)