<u>Constructing Task:</u> Measurement Line Plot

(Approximately 1 Day)

STANDARDS FOR MATHMATICAL CONTENT

CCGPS.2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

CCGPS.2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

STANDARDS FOR MATHEMATICAL PRACTICE

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.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

***<u>Mathematical Practices 1 and 6 should be evident in EVERY lesson.</u> ***

BACKGROUND KNOWLEDGE

(Information quoted from Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades K-3, page 321)

"Bar graphs or picture graphs are useful for illustrating categories of data that have no numeric ordering- for example, colors or TV shows. When data are grouped along a continuous scale, they should be ordered along a number line. Examples of such information include temperatures that occur over time, height or weight over age, and percentages of test takers scoring in different intervals along the scale of possible scores."

Line plots are useful tools for collecting quantitative data because they show the number of things along a numeric scale. They are made by simply drawing a number line then placing an X above the corresponding value on the line that represents each piece of data. Line plots are essentially bar graphs with a potential bar for each value on the number line. This standard calls for students to represent the length of several objects by making a line plot. Students should round their lengths to the nearest whole unit.

ESSENTIAL QUESTION

- How does a line plot help me share data?

MATERIALS
- Ruler
- Paper

GROUPING
Small Group or Partners

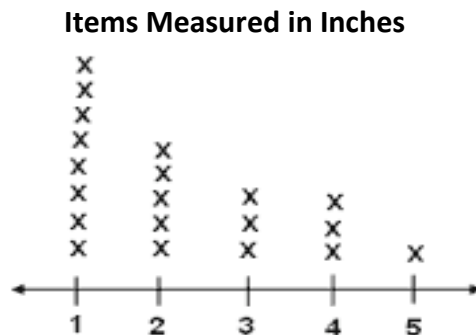## TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION
Gather the students on the classroom rug and discuss previous lessons on measuring. Ask a child to remind the class about using a ruler and the correct way to measure items. For this task the students will be measuring 10 items that are smaller than their ruler. Pair up the students and have them go about the classroom and measure 10 items that are smaller than their ruler. **For this task they will be measuring each of the 10 items in inches *and* in centimeters so they can create two separate line plots.** They should record the item and its measurement on paper or in their math journal.

After the groups have made their list of 10 items, have them all join you back on the classroom rug. Randomly call on some groups to give you some examples of items they measured. List these items on chart paper and record their measurement both in centimeters and in inches. After listing some ask them if they know how to graph these measurements. Accept both yes and no responses and any ideas they have. After getting some ideas from the students, share with them what a line plot graph is and its purpose.

As a group, model how to create a line plot graph using their inch measurements. See graphic below for help. To make a line plot, a number line is drawn and an X is made above the corresponding value on the line for every corresponding data element. After graphing the inch measurements lead the students back to their partners to create their separate line plot graph using their centimeter measurements.

After the students have created their centimeter line plot graphs, give them time to share their graphs with another group. Let them list the similarities and differences in their graphs in their math journals.

Sample Line Plot Graph: **Items Measured in Inches**

FORMATIVE ASSESSMENT QUESTIONS
- What numbers did you use on your line plot graph? Why?
- What can you tell me about the information on your graph?

DIFFERENTIATION
Extension
- Let some students measure using centimeters. This might lead them to make their line plot graph quite large in terms of the measurements.
- Have students find items larger than a foot.

Intervention
- Give the students a recording sheet that already has a number line on it so that they can label the numbers and put the X for each measurement.