

Mathematics: The Language of STEM
Show your Data - Line Plot and Length
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Grade Level(s): 3

Description of the Task:

Students will measure 8 crayons and record the measurements to the nearest quarter-inch,. Students will use the data collected to create a line plot.

Indiana Mathematics Content Standards:

3.DA.2 - Generate measurement data by measuring lengths with rulers to the nearest quarter of an inch. Display the data by making a line plot, where the horizontal scale is marked off in appropriate units, such as whole numbers, halves, or quarters.

Indiana Mathematics Process Standards:

PS.3 - Construct viable arguments and critique the reasoning of others.

PS.4 - Model with mathematics.

PS.5 - Use appropriate tools strategically.

PS.6 - Attend to precision.

Mathematics Content Goals: The students will measure lengths to the nearest quarter-inch using a ruler and show the data using a line plot to accurately represent the results.

Language Objectives: The students will compare measurements orally. Students will measure again if there is a difference in data and have a discussion to why different results occurred.

Materials:

Rulers

Graph paper

Blue Crayons Print off (attached)

Data Recording Half-Sheet (attached)

Pencil paper for optional Assessment (attached)

THE LESSON

Before:

Teacher Actions: *Be sure to measure the 8 crayons yourself for modeling the line plot before starting the lesson.

1. **Say**, "Today we will be measuring crayons to the nearest quarter-inch. We will then compare our findings by plotting them using a line plot."

2. Model measuring with a ruler to the nearest inch, half-inch, and quarter-inch. Place a ruler under your document camera (or device provided) and draw lines on the whiteboard to model each measurement (nearest inch, half-inch, and quarter-inch).
3. Tell students they will need to record each measurement into the data sheet. Model putting some numbers into the data recording half-sheet for students see.
4. Using graph paper, show students how to use data measured and plot it on a line plot.
5. First, draw a straight line long enough for the shortest measurement up to the longest measurement. Space the other numbers on the line accordingly to the scale you choose.
6. Let students know that the line with the numbers represents the lengths measured. Label it for students to see. Next, let students know to use the letter "X" to show one crayon. Let them know to put an X above each time a length was measured (It is ok to be brief with this step. Students may benefit by learning as doing when plotting the X's. They will learn by mistakes).
7. Leave the line plot you started on the whiteboard for students to use as a guide.
8. Release students to get rulers, data recording sheets, crayon papers, and graph papers.

Student Actions:

1. Review measuring to the nearest quarter-inch.
2. Learn about the materials needed and a basic understanding of a line plot.
3. Collect materials.

During:

Teacher Actions:

1. Walk around remind students of directions.
2. Help students as needed.
3. Look for students who finish measuring and help them find a person to compare data with. If there is a difference in results. Have both students remeasure together to find the right measurement.
4. Look for students making the line plot. Be sure they make the line and have it labeled correctly with the appropriate scale.
5. Students who finish early, can remeasure the crayons to the nearest half-inch and make a new line plot on the back and compare the two created line plots.

After:

Teacher Actions:

1. Have each students partner up and share/show the line plot created. Students need to show his/her data recording sheet, the line plot, and what their line (scale looks like). Share what looks the same or different.
2. Switch partners two more times so students meet with 3 total students.
3. Bring students back together and ask the questions below in the ask section.
4. Allow students to go back and change /fix any mistakes made or new things learned from discussion.
5. Collect final projects after corrections can be made (Be sure the line plot is titles, labeled, and a key for X).

Student Actions:

1. Share the line plot made.

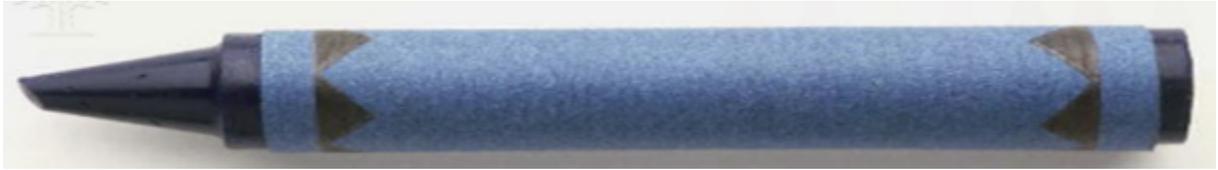
2. Discuss similarities and differences.
3. Answer teacher questions and listen to review or learn something new.
4. Adjust line plots where needed.

ASSESSMENT

1. Collect blue Crayon line plot to see if students were able to fix or adjust line plots after the discussion. I do not think many line plots will be “Perfect” in the first attempt.
2. OPTIONAL - Use the pencil sheet and students can do this activity again as a summative assessment.

Ask:

1. What measurement had the most crayons measured to that length? The least?
2. Did any lengths on the line not have any crayons measure to that length?
3. What does X represent on the line plot?
4. Are any line plots different from anyone else's?
5. Why might that be?
6. What are possible reasons for different line plots?
7. Why is this challenging/
8. Why did I (the teacher) put the lowest measured crayon first and go to the highest measured crayon on the line?
9. How did I know what other numbers to put on the line?



Name:

Crayon Number	Length to the nearest quarter-inch
Crayon #1	
Crayon #2	
Crayon #3	
Crayon #4	
Crayon #5	
Crayon #6	
Crayon #7	
Crayon #8	

Name:

Crayon Number	Length to the nearest quarter-inch
Crayon #1	
Crayon #2	
Crayon #3	
Crayon #4	
Crayon #5	
Crayon #6	
Crayon #7	
Crayon #8	

