

Cluster 1: Creating Classroom Community through Data and Graphing

Duration: 2-3 weeks

Content Standards:

This list includes standards that will be addressed in this cluster, but not necessarily mastered, since all standards are benchmarks for the end of the year. Please note strikethroughs and recommendations in the Important Considerations section for more information.

NC.5.MD.2

Represent and interpret data.

- Collect data by asking a question that yields data that changes over time.
- Make and interpret a representation of data using a line graph.
- Determine whether a survey question will yield categorical or numerical data, or data that changes over time.

NC.5.G.1

Graph points in the first quadrant of a coordinate plane, and identify and interpret the x and y coordinates to solve problems.

NC.5.OA.3

Generate two numerical patterns using two given rules.

- Identify apparent relationships between corresponding terms.
- Form ordered pairs consisting of corresponding terms from the two patterns.
- Graph the ordered pairs on a coordinate plane.

Mathematical Practices:

- 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.**

What is the mathematics?

- Develop mathematicians with positive attitudes about their ability to do mathematics by:
 - Creating opportunities to develop an appreciation for mistakes
 - Seeing mistakes as opportunities to learn
 - Teaching students to take responsibility for their learning
- Develop mathematicians who respect others by:
 - Demonstrating acceptance, appreciation, and curiosity for different ideas and approaches
 - Establishing procedures and norms for productive mathematical discourse
 - Consider other solution paths
- Develop mathematicians with a mindset for problem solving by:
 - Encouraging student authority and autonomy when problem solving
 - Emphasizing questioning, understanding, and reasoning about math, not just doing math for the correct answer
 - Asking follow-up questions when students are both right and wrong
 - Allowing students to engage in productive struggle and moving them along by questioning, not telling

- Data standards are accessible for all teachers and students at the beginning of the year. Surveys and data collection are a nice way for students to get to know each other (ex. How many seconds does it take you to run a lap around the track? How many minutes are you on electronic devices each day?) and for them to get to know their new classroom (ex. How many books do we have in each genre in our classroom library?). Data standards can also be integrated with Science and Social Studies as appropriate (ex. collecting temperature, rainfall, and humidity data daily); In Grade Five students graph data with line graphs which involve work in the first quadrant of a coordinate plane.
- Students generate shape and numerical patterns which lends itself to x,y coordinate points. The ordered pairs of corresponding terms can be graphed on a coordinate plane.

Important Considerations:

- For success, significant time should be spent setting up the classroom. This includes:
 - Developing classroom norms for communication (ex: non-verbal signals, listening and speaking expectations, talk moves for math discussions)
 - Developing math routines (ex: number of the day, number talks, number strings, and other appropriate math routines)
 - Setting various expectations for the structure of the math block (ex: expectations for whole class instruction, cooperative learning, independent learning, effective integration of technology, etc.)
 - Math discourse needs explicit modeling and practice
 This includes students:
 - Sharing their thinking
 - Actively listening to the ideas of others
 - Connecting to others' ideas
 - Asking questions to clarify understanding
- Students should be actively involved in asking questions, collecting data, and developing graphs appropriate for the data source.
- Line graphs are new in fifth grade. In fourth grade, students worked with frequency tables, scaled bar graphs, and line plots. Students need to be able to distinguish between categorical and numerical data (including distinguishing data that changes over time as data that can be represented with a line graph on a coordinate plane).
- Tasks involving shape patterns lend themselves to classroom discussions in which to teaching classroom norms for math talk. Visual patterns can be seen and described in many ways and can be represented in pictures, in a function table, in words, and on a coordinate plane (line graph show how the pattern grows from term to term) to help students begin to listen to and critique others' reasoning and make connections among representations.

