Archdiocesan Curriculum > Grade 5> Math > Length of unit 18 to 21 days

Stage 1: Desired Results

General Information

This unit focuses on identifying and analyzing patterns, graphing relationships, and collecting and interpreting data. Students learn to represent numerical patterns in tables and graphs, understand the coordinate plane, and use measures of center to summarize data. The unit emphasizes both the creation and analysis of visual data representations.

Mathematical Practices
- MP2 – Reason abstractly and quantitatively
- MP4 – Model with mathematics
- MP5 – Use appropriate tools strategically
- MP6 – Attend to precision
- MP7 – Look for and make use of structure

Essential Question(s)

- How can patterns in tables and graphs be represented and described?

- What information can be communicated through data visualizations?

- How does the coordinate plane help us represent relationships between numbers?

- What do measures of center tell us about a data set?

- How can we collect, organize, and interpret real-world data effectively?

Enduring Understanding/Knowledge

Students will:
- Generate a number pattern.
- Write a rule to describe a pattern.
- Write a rule for a pattern given in a graph.
- Graph a number pattern.
- Graph and name points on a coordinate plane using ordered pairs.
- Collect and graph data on a coordinate plane.
- Graph the relationship between two numerical patterns on a coordinate grid.

Review/Assess
- Collect and organize data by conducting a survey or making an observation.
- Make and use line plots with fractions and decimals to solve problems.
- Analyze and display data in a line graph.
- Understand the mean as a fair share and as a balance point.
- Summarize a data set using mean, median, mode, and range.

Review/Assess

Vocabulary

New	Review
- ordered pair - origin - x-axis - x-coordinate - y-axis - y-coordinate - data - mean - range - interval - line graph - scale - measure of center - median - mode	- pattern - rule - graph - table - coordinate grid - number line - points - collect - organize - represent - interpret - compare - survey - decimals - fractions

Connections to Catholic Identity / Other Subjects

Religion/Catholic Identity:
- In Irish Roman Catholicism, a pattern is a devotional event that takes place on a parish's patron saint's feast day, or the nearest Sunday. This day is called a Pattern day or Pattern Sunday.
- By plotting multiple churches on a coordinate grid, you can visualize patterns of church frequency or distribution across a city or region.
- You can use the coordinates to measure distances between churches, identify clusters, or analyze

Differentiation

Enrichment
- **Extend Graphing to All Four Quadrants** – Introduce graphing in all four quadrants of the coordinate plane.
- **Create Real-World Surveys** – Have students design and conduct a survey, analyze results, and present data visually.
- **Multiple Representations of Patterns** – Challenge students to express patterns as tables, rules, graphs, and verbal descriptions.

their proximity to other important locations like schools or hospitals.

Other Subject Here:
- **ELA:** Make a list of the number of books read so far this school year. This data set could expand to collect results from other classrooms and grade levels. Create a line plot using the data to represent reading progress so far this year.

- **Social Studies:** Make the connection between longitude and latitude lines and the coordinate plane. While longitude and latitude are slightly different because the Earth is a sphere, the concept of each location having a longitude and latitude location will connect with graphing ordered pairs using the x and y axes.

- **Interpret Complex Graphs** – Analyze multi-line graphs or data sets involving multiple variables.
- **Use Technology Tools** – Allow students to use digital graphing tools or spreadsheets for data representation.

Support
- **Use Visual Supports for Patterns** – Provide manipulatives and visuals for identifying number patterns.
- **Step-by-Step Graphing Support** – Guide students through plotting points using scaffolds like color coding and graph templates.
- **Simplify Data Sets** – Provide smaller or familiar data sets to reduce cognitive load.
- **Practice Vocabulary with Real-Life Examples** – Connect new terms to everyday experiences (e.g., using a thermometer or calendar).
- **Pre-Teach Key Concepts** – Introduce coordinate planes and data displays in small groups before whole-class instruction.

Standards & Benchmarks

Graphs and Patterns:

5.G.2
Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

5.G.1.b
Using quadrant one on the coordinate plane, understand that the first number in a coordinate pair indicates how far to travel from the origin in the direction of the horizontal axis, and the second number indicates how far to travel in the direction of the vertical axis, with the convention that the names of the two axes and the coordinates correspond (x-axis and x-coordinate, y-axis and y-coordinate).

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, and graph the ordered pairs on a coordinate plane. For example, given the rule "add 3" and the starting number 0, and given the rule "add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

5.OA.B.3
Generate two numerical patterns using two given rules (e.g., generate terms in the resulting sequences). Identify and explain the apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane (e.g., given the rule "add 3" and the starting number 0, and given the rule "add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence).

Collect, Represent, and Interpret Data:

5.MD.2
Make a line plot to display a data set of measurements in fractions of a unit (halves, quarters, eighths). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given graduated cylinders with different measures of liquid in each, find the amount of liquid each cylinder would contain if the total amount in all the cylinders were redistributed equally.

5.MD.B.2
Make a line plot to display a data set of measurements in fractions of a unit (1/8, 1/2, 3/4). Use operations on fractions for this grade to solve problems involving information presented in line plots.

MD.M.5.19
Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots (e.g., given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally).

Teaching Ideas/Resources
Websites/Resources:

- **Georgia Department of Education Air Traffic Control Activity** – This interactive activity allows students to practice with the coordinate plane in the context of air traffic control.
- **Understanding Line Plots** – This video models understanding data through a test question. I would use this video as a review after teaching the unit.
- **Creating a Line Plot** – This video demonstrates how to create a line plot.
- **Line Plot Activities** – This is a hands-on way to introduce creating and interpreting line plots with your students.
- **Line Plot Activities** – More hands-on activities for creating and interpreting line plots.