



# Northside High School

## Geometry Curriculum

### Unit 7: Coordinate Geometry

Unit Length: 15 days

Domain: Expressing Geometric Properties with Equations

- Cluster 13: Use coordinates to prove simple geometric theorems algebraically.

Standards:

- \*HSG.GPE.B.4:
  - Use coordinates to prove simple geometric theorems algebraically.
- \*HSG.GPE.B.5:
  - Prove the slope criteria for parallel and perpendicular lines.
  - Use the slope criteria for parallel and perpendicular lines to solve geometric problems
  - Note: Examples should include but are not limited to finding the equation of a line parallel or perpendicular to a given line that passes through a given point.
- \*HSG.GPE.B.6:
  - Find the midpoint between two given points; and find the endpoint of a line segment given the midpoint and one endpoint
- \*HSG.GPE.B.7:
  - Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.
  - Note: Examples should include, but are not limited using the distance formula and area of composite figures.
- HSG.CO.E.14:
  - Apply inductive reasoning and deductive reasoning for making predictions based on real world situations using:
    - Conditional Statements (inverse, converse, and contrapositive).
    - Venn Diagrams.
  - Note: This is not intended to be an isolated topic but instead to support concepts throughout the course.

*\*Guaranteed Viable Curriculum*



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Vocabulary to Emphasize:

- Coordinate.
- Distance.
- Length.
- Midpoint.
- Endpoint.
- Slope.
- Positive.
- Negative.
- Horizontal.
- Vertical.
- Parallel.
- Perpendicular.
- Reciprocal.



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### Unit 7: Part 1: Equations of Lines, Distance, Midpoint, & Slope

8 days

Essential question: How does Geometry apply to the coordinate plane?

Learning Goal	Notes	Bellwork/Exit	Practice
Students will solve equations to find the distance and midpoint.	Distance and Midpoint Notes.	<b>BW:</b> <ul style="list-style-type: none"><li>• Pre-assessment.</li><li>• Coordinate Geo #1.</li></ul>	Distance and Midpoint Practice #1. Scavenger Hunt Cards.* Scavenger Hunt Answer Page. *Scavenger Hunt goes with the practice page if you want to do this. Work the first two problems with the students before they begin.
Students will solve equations to find the distance and midpoint.		<b>BW:</b> <ul style="list-style-type: none"><li>• Coordinate Geo #2.</li></ul>	Distance Practice #2. Midpoint Practice# 2.* *resource from <a href="https://www.kutasoftware.com/freeipa.html">https://www.kutasoftware.com/freeipa.html</a> Pre-AP/Enrichment <ul style="list-style-type: none"><li>• Distance and Midpoint Homework.*</li></ul> *resource from Holt Geometry textbook and workbook pages
Students will use the distance formula to calculate perimeter and find an endpoint of a line segment given one endpoint and the midpoint.		<b>BW:</b> <ul style="list-style-type: none"><li>• Coordinate Geo #3.</li></ul>	Distance and Midpoint Practice #3.* *may want to hand out graph paper to go with this sheet
Students will find the slope of a line from a graph, points, and an equation.	Slope Notes.	<b>BW:</b> <ul style="list-style-type: none"><li>• Coordinate Geo #4.</li></ul>	Slope Practice Worksheet.



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Learning Goal	Notes	Bellwork/Exit	Practice
Students will determine the criteria for parallel and perpendicular slopes.	Parallel & Perpendicular Slope Flipbook.*  Parallel & Perpendicular Flowchart.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/07/parallel-and-perpendicular-lines.html">http://newellssecondarymath.blogspot.com/2016/07/parallel-and-perpendicular-lines.html</a>		Pre-AP/ Optional Homework: <ul style="list-style-type: none"><li>Parallel &amp; Perpendicular Practice.</li></ul>
Students will write equations of lines with a given point and slope.	Equations of Lines Foldable.*  Equations of Lines Formula Page.* *resources from <a href="http://newellssecondarymath.blogspot.com/2016/07/inb-pages-for-equations-of-parallel-and.html">http://newellssecondarymath.blogspot.com/2016/07/inb-pages-for-equations-of-parallel-and.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Coordinate Geo #6.</li></ul>	Equations of Lines in Point-Slope form.
Students will analyze the standard form of an equation of a line and graph the lines.	Standard Form Notes.	<b>BW:</b> <ul style="list-style-type: none"><li>Coordinate Geo #7.</li></ul>	Graphing Lines in Standard Form.* *resource from <a href="https://cdn.kutasoftware.com/Worksheets/Alg1/Graphing%20Lines%20SF.pdf">https://cdn.kutasoftware.com/Worksheets/Alg1/Graphing%20Lines%20SF.pdf</a>
Students will write equations of lines that are parallel or perpendicular to a given line.	Writing Parallel and Perpendicular Equation Notes.* *resources from <a href="http://newellssecondarymath.blogspot.com/2016/07/inb-pages-for-equations-of-parallel-and.html">http://newellssecondarymath.blogspot.com/2016/07/inb-pages-for-equations-of-parallel-and.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Coordinate Geo #8.</li></ul>	Graphing Parallel & Perpendicular Lines.

CFA #1 Version A: Distance, Midpoint, & Slope

CFA #1 Version B: Distance, Midpoint, & Slope



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### Unit 7: Part 2: Proving Quadrilaterals

7 days

Essential questions: What are the properties of quadrilaterals?  
How can you prove whether or not something is a quadrilateral?

Learning Goal	Notes	Bellwork/Exit	Practice
Students will use coordinate geometry to prove quadrilaterals.	Proving Quadrilateral Notes.	<b>BW:</b> <ul style="list-style-type: none"><li>Quad Proofs #1.</li></ul>	Proving Quadrilaterals Worksheet.
Students will use coordinate geometry to prove quadrilaterals.		<b>BW:</b> <ul style="list-style-type: none"><li>Quad Proofs #2.*</li></ul> *provide graph paper as needed	Proving Quadrilaterals, Distance, & Midpoint Practice.
Students will solve equations and graph them on the coordinate plane.		<b>BW:</b> <ul style="list-style-type: none"><li>Quad Proofs #3.*</li></ul> *provide graph paper as needed	IXL: E.3, E.4, E.5, E.6.
Students will solve equations based on the properties of quadrilaterals.		<b>BW:</b> <ul style="list-style-type: none"><li>Quad Proofs #4.*</li></ul> *provide graph paper as needed	IXL: N.3, N.4, N.5.
Students will use coordinate geometry to prove quadrilaterals.		<b>BW:</b> <ul style="list-style-type: none"><li>Quad Proofs #5.*</li></ul> *provide graph paper as needed	Explorations in Core Math Geometry Workbook, Sections 6-3 and 6-5, coordinate geometry problems.



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Learning Goal	Notes	Bellwork/Exit	Practice
Students will use coordinate geometry to prove quadrilaterals.		<b>BW:</b> <ul style="list-style-type: none"><li>• Quad Proofs #6.*</li></ul> *provide graph paper as needed	Explorations in Core Math Geometry Workbook, Sections 6-3 and 6-5, coordinate geometry problems.

CFA #2 Version A: Quad Proofs

CFA #2 Version B: Quad Proofs

Unit 7 Common Summative Assessment



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### Unit 7 previous learning: Where do I start/What should they know?

3.G.1	Understand that shapes in different categories (e.g. rhombuses, rectangles, and others) may share attributes (e.g. having four sides). And that the shared attributes can define a larger category (e.g. quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
5.G.1	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
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.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
A.REI.6	Solve systems of linear equations exactly and approximately (e.g. with graphs), focusing on pairs of linear equations in two variables.