

Core Content

Cluster Title: Graph points on the coordinate plane to solve real-world and mathematical problems.

Standard 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).

MASTERY Patterns of Reasoning:

Conceptual:

Students understand how to construct a coordinate grid using perpendicular lines.

Students understand the role and location of the origin while plotting an ordered pair.

Students can travel horizontally and vertically within the grid, using their understanding of number lines.

Students will understand that the ordered pair is a set of numbers indicating direction and magnitude of movement horizontally and vertically within the coordinate plane.

Students will understand that the horizontal axis is the x -axis and the vertical axis is the y -axis.

Students understand that the ordered pair $(0, 0)$ refers to the origin.

Procedural:

Students can correctly construct and label the axes and the intervals on each axis within a coordinate grid.

Students can identify the number in an ordered pair that is the x -coordinate (which coincides with the x -axis) and the number that is the y -coordinate (which coincides with the y -axis).

Students will match a coordinate pair with a given point within quadrant I.

Representational:

Students can show movement along the axes coinciding with the x -coordinate and y -coordinate.

Students will properly draw and label the axes and origin on a coordinate plane.

Supports for Teachers

Critical Background Knowledge	
<p>Conceptual:</p> <ul style="list-style-type: none"> Students have an understanding of perpendicular lines. Students understand the terms “vertical,” “horizontal,” and “intersect.” Students know how to move along a number line (including varied intervals). Students can explain how to move along paths in real-world situations involving distance. For example, which is farther from the school—the grocery store or the post office—and in what direction would you have to travel to get to there. Students understand that you begin at zero when working with a number line. Students can explain how a number line works, even if it is displayed vertically. <p>Procedural:</p> <ul style="list-style-type: none"> Students will be able to locate points on a number line despite its orientation. Students can create number lines with differing intervals. <p>Representational:</p> <ul style="list-style-type: none"> Students can represent vertical and horizontal lines. Students can represent intersecting perpendicular lines. Students can create number lines. 	
Academic Vocabulary and Notation	
perpendicular, right angle, intersect, vertical, horizontal, coordinates, x-axis, y-axis, coordinate plane/grid, origin, x-coordinate, y-coordinate, ordered pair, intervals	
Instructional Strategies Used	Resources Used
<p>Create a life-size grid in the classroom on the floor using yarn to make the perpendicular axes. Label the axes. Have students physically move along the grid, exploring movements along the x-axis and the y-axis, then discuss how that movement can be represented with ordered pairs.</p> <p>Use multimedia to explore grids and the use of ordered pairs (see resources for “Ordered Pairs”).</p>	<p>Ordered Pairs http://www.learnalberta.ca/content/me5l/html/math5.html</p> <p><i>Fly on the Ceiling</i>, by Dr. Julie Glass ISBN: 0-679-88607-9</p>

Assessment Tasks Used	
<p>Skill-Based Task: On a coordinate grid, have students identify a specific point (e.g., What are the coordinates of the point where the rabbit is located?).</p> <p>Give students ordered pairs that they must match to points on the plane within the first quadrant.</p> <p>Students label the origin, x- and y-axes, and correct intervals on graph paper with a set of perpendicular lines and a set of points already drawn. Have student match the previously drawn points to the correct ordered pair from a list of given coordinate pairs.</p>	<p>Problem Task: Give students a map of the school on a coordinate grid and ask them to identify where certain places in the school are found. Then have students tell what is located at a particular given coordinate pair.</p>