Grade 5, Module 6: Problem Solving with Coordinate Plane

What is this module about? Students develop a coordinate system for the first quadrant of the coordinate plane and use it to solve problems. They explore the relationship between points, ordered pairs, patterns, and lines.

What came before this module? Students worked with three-dimensional shapes and explored cubic units and volumes of rectangular prisms. They also calculated area for figures with fractional side lengths.
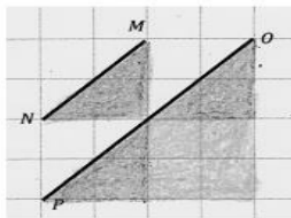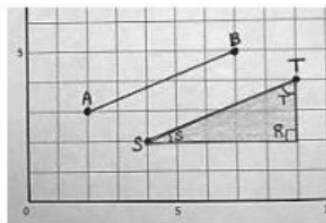
What comes after this module? This is the final module of Grade 5.
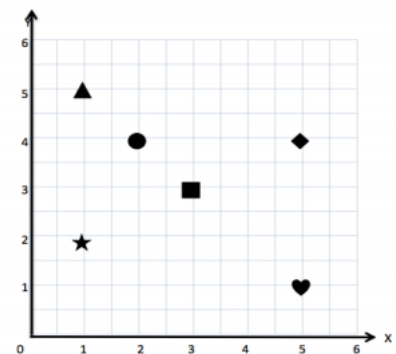
How can you help at home?

- Play the game Battleship if you have it! It gives good practice with locating points on a coordinate plane.
- Practice following rules to find ordered pairs, e.g., if the rule is y=double x plus 1, what is y if x is 3? 4? 5? (Answers are 7, 9, 11).

Drawing figures on the coordinate plane.

The coordinate plane.

Key Words and Ideas in this Module

- **Axis**: fixed reference line for the measurement of coordinates
- **Coordinate**: number that identifies a point on a plane
- **Coordinate pair**: two numbers that are used to identify a point on a plane; written (x, y) where x represents a distance from 0 on the x-axis and y represents a distance from 0 on the y-axis
- **Coordinate plane**: plane spanned by the x-axis and y-axis in which the coordinates of a point are distances from the two perpendicular axes
- **Ordered pair**: two quantities written in a given fixed order, usually written as (x, y)
- **Origin**: fixed point from which coordinates are measured; the point at which the x-axis and y-axis intersect

Key Standards in this Module

- Write and interpret numerical expressions.
- Analyze patterns and relationships.
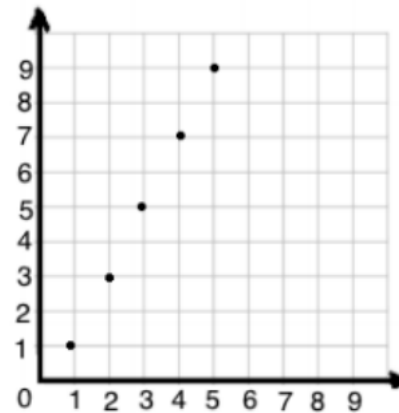- Graph points on the coordinate plane to solve mathematical problems.

Graphing Lines

Module 6, the final module of Grade 5, is a very important link to the algebraic skills students will need in later years. Students begin by investigating patterns, relating the x- and y-coordinates of the points on the line and reasoning about the patterns in the ordered pairs, which lays groundwork for Grade 6 work with proportional reasoning. Students use given rules (e.g., "multiply by 2, then add 3") to generate coordinate pairs, plot points, and investigate relationships. Finally, students generate two number patterns from two given rules, plot the points, and analyze the relationships within the sequences of the ordered pairs and the graphs of the two lines.

The rule table and the plotted points for the rule "Double x, then subtract 1"

Rule: Double x, then subtract 1.

x	y	(x, y)
1	1	(1,1)
2	3	(2,3)
3	5	(3,5)
4	7	(4,7)
5	9	(5,9)

Sample problem from Module 6 (Lesson 20)

Harry runs a hot dog stand at the county fair. When he arrived on Wednesday, he had 38 dozen hot dogs on his stand. The graph shows the number of hot dogs (in dozens) that remained unsold at the end of each day of sales.

1. How many dozen hot dogs did Harry sell on Wednesday? How do you know?
2. Between which two-day period did the number of hot dogs sold change the most? Explain how you determined your answer.

Adapted from Eureka Math Tips for Parents, Prepared by Erin Schweng, Math Coach