

UNIT PLANNING TOOL

Planning Focus: Coordinate Plane

Module(s)/Unit(s) Carnegie Learning Module 4 Topic 2

CCSSM: *The Number System*

Apply and extend previous understandings of numbers to the system of rational numbers.

6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
 - b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
 - c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Essential Questions

How does the coordinate system work?

How do coordinate grids help us organize information?

How does a coordinate grid help me understand a relationship between two numbers?

Key Concepts

Understand number lines with positive and negative values.

Understand absolute value.

Find the area and volume of figures.

Use ratio and rate reasoning to solve problems.

Solve, graph, and analyze one-step equations.

Coordinate plane quadrant I

Visual Models/ Algorithms/ Diagrams for Compendium

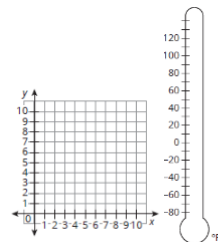
See attached Compendium.

Pre and Post Assessments

Preassessment: Mixed Practice Topic 1 #5 and end of topic review #9-16

Preassessment for demo:

- Plotting positive and negative numbers on vertical and horizontal number lines
- Plotting points in quadrant I of the coordinate plane



Post assessment: End of topic test

Connections (Real World Applications)

- Cartography (mapping)
- Air traffic control
- Art
- Scaling
- Graphing data
- Technology – touchscreens
- Gaming
- Radar – military, satellites

Language Functions/Structures

Functions: Explain. Describe. Compare

Structures: I drew ____ because _____. I used a number line and started at _____.

On the graph, _____ correlates to _____ because _____.

The Cartesian coordinate plane has ...

The y-axis is different than the x-axis because _____.

The y-coordinate (x-coordinate) is ____ because ...

The coordinates for ____ are _____. The ordered pair for ____ is _____.

Vocabulary

- | | | |
|---------------------|----------------------------------|-----------------|
| • absolute value | • quadrant(s) (I, II, III or IV) | • origin |
| • coordinates | • positive | • point |
| • coordinate plane | • negative | • x-axis |
| • coordinate system | • vertical | • y-axis |
| • first quadrant | • horizontal | • ordered pairs |
| • opposite | | |

Focus and Motivation

Literature – *Less than Zero* by Stuart Murphy (positive and negative integers)

Sir Cumference and the Vikings Map by Cindy Neuschwander (coordinate plane)

Songs - [Coordinate Plane Song](#) - Plotting Points on all 4 Quadrants

[Plotting Points on a Coordinate Plane](#) (Taylor Swift, Love Story Parody)

[Whole and Real Numbers](#) (Taylor Swift - Cruel Summer Parody)

[Coordinate Plane Song](#) | Cartesian Plane| 5th and 6th Grade Math| eSpark Music

Animations – Coordinate Plane – brainpop.com

Ordered Pairs – studyjams.scholastic.com

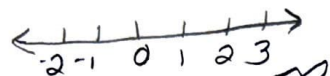
Game – Game Over Gopher mathsnacks.com Coordinate Plane

Human Number Line and Coordinate Plane – module 4 Carnegie Learning

Fact or myth? Coordinate Geometry: How Descartes created the Cartesian Plane

Number Lines

horizontal → X-axis



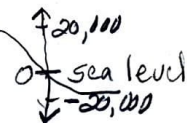
- used in sports
- money
- owe \$ □
- own \$ ⊕



temperature

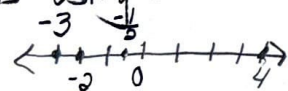


elevation



Inequalities

Comparing + and - numbers using a # line



$$-\frac{1}{2} > -3 \quad -2 < 4$$

Absolute Value

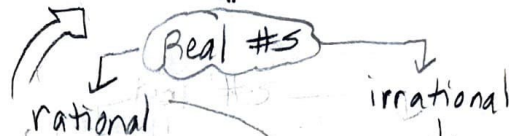


distance from 0 on a # line

$$\begin{aligned} |5| &= 5 & |-7.2| &= 7.2 \\ |-5| &= 5 & |7.2| &= 7.2 \\ |0| &= 0 \end{aligned}$$

Rational Numbers

have a specific point on a # line



fractions: $\frac{3}{4}, -\frac{2}{3}, -1\frac{1}{4}$
terminating decimal: 2.3
decimal that ends

integers: $\dots, -2, -1, 0, 1, 2, \dots$
whole #s: 0, 1, 2, 3, 4, ...
not fractions

whole #s: 0, 1, 2, 3, 4, ...

natural or counting #s: 1, 2, 3, 4, ...

that are not rational

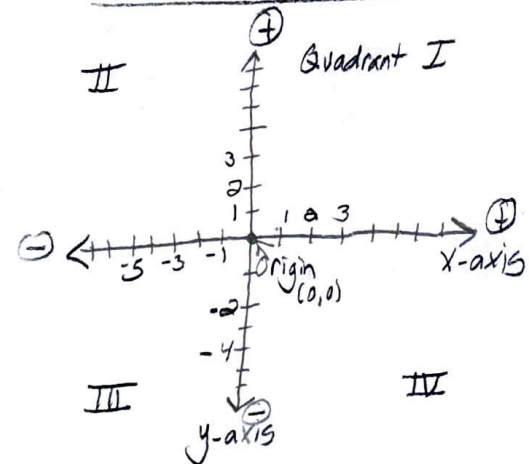
In decimal form, a # that does not repeat or terminate

$$\pi(p.i.) \approx 3.14159... \\ \sqrt{2} \approx 1.4142135...$$

in decimal form goes on forever

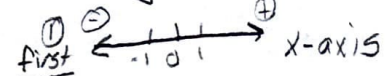
specific point on a # line

Coordinate Plane



ordered pairs

(x, y) ← point marks a spot



first second

Application

- maps
- air traffic control



Mathematical Standards and Practices

We will use precision to find and position rational numbers on a horizontal or vertical number line.

We will make sense of how coordinate planes are used in real-world situations.

Rational #s Inquiry Chart

What we know about _____?

What we want to learn about _____?