This Coordinate Geometry Unit will encompass 2 MAJOR concepts – both of which you know from your MS Math experiences. The MAJOR concepts are: (1) Basic Calculations of Length, Midpoint & Circles and (2) characteristics of Geometric Shapes Functions – Triangles & Quadrilaterals. These major concepts will be continually revisited in later units in the course, so it is important to understand these concepts and master the required skills.

(1) <u>Basic Calculations:</u>

- Know and be able to use the formula for slope in geometric applications & real world contexts. **(R)**
- Know and be able to use the formula for midpoint of a line segment in geometric applications & real world contexts. **(R)**
- Know and be able to use the formula for midpoint in geometric applications & real world contexts. **(R)**
- Work with the length and midpoint formulas to understand how the equation of a circle is derived. **(N)**
- Know and be able to use the formula for the equation of a circle centered at (0,0) in geometric applications & real world contexts. **(N)**
- Know and be able to use the formula for the equation of a circle centered at (h,k) in geometric applications & real world contexts. **(N)**
- Use dynamic geometry software (Geogebra or Geometers SketchPad) to construct quadrilaterals and triangles and perform basic calculations & constructions **(N/R)**
- Work with geometric shapes used in representations of real-world situations. **(R)**

(2) <u>Geometric Shapes:</u>

- Classify triangles types according to the calculated length of the sides. **(R)**
- Understand how the various quadrilaterals differ from one another. **(R)**
- Use length and slope calculations to classify quadrilaterals **(R)**
- Determine slopes and equations of perpendicular bisectors **(N)**
- Draw triangles & quadrilaterals using coordinates via sketches, graphs or dynamic geometry software **(R/N)**
- Use slope to determine whether or not right angles are present in geometric figures **(N)**
- Develop a general "template" for presenting simple geometric "proofs" **(N)**
- Work through simple proofs of geometric properties of quadrilaterals, triangles & circles **(N)**
- Examples of geometric properties to be "proven" would involve mid-segments, diagonals, perpendicular bisectors, triangle centers, altitudes of triangles, & some simple circle theorems involving chords. **(N)**