Integrated Math 2, Part 2
Course Outline & Objectives

Course Description:
In Integrated Math 2 Part 2, students apply strategies they have learned for representing a quantity, creating an equation, and finding a solution to the context of modeling Geometric relationships in polygons, quadrilaterals, similar triangles, right triangles, circles, and three-dimensional figures.

Credits - One Semester (0.5 Carnegie unit / CA: 5 credits)
Prerequisites: Integrated Math 1; Integrated Math 2, Part 1

Course Outline

Unit 1 – Quadrilaterals and Other Polygons

1.1 Angles of Polygons
1.2 Properties of Parallelograms
1.3 Proving Quadrilaterals as Parallelograms
1.4 Properties of Special Parallelograms
1.5 Conditions for Special Parallelograms
1.6 Trapezoids and Kites

Common Core Standards

In this unit:
Students will explore polygons, with a focus on quadrilaterals. They will learn to recognize parallelograms, squares, rectangles, rhombuses, and kites based on properties related to the length of opposite sides, angles, diagonals, etc. Using these properties, theorems, algebra and coordinate geometry, students will prove a quadrilateral is a parallelogram. They will learn to determine if a quadrilateral is a trapezoid or a kite by examining diagonals, opposite sides, and opposite angles.

A.SSE.1, G.CO.11, G.SRT.5

Unit 2 – Triangle Similarity

2.1 Dilations
2.2 Similarity and Transformations
2.3 Similar Polygons
2.4 Proving Similar Triangles by AA
2.5 Proving Triangles by SSS and SAS
2.6 Proportionality Theorems

In this unit:
Students will learn how a dilation is a transformation that creates similar figures in the coordinate plane. They will extend their understanding of similarity to composite transformations which include dilations, translations, rotations and reflections. They will explore the definition of similar polygons not on the coordinate plane. Using the AA, SSS, and SAS similarity theorems, they will learn to prove triangles are similar, as well as apply these principles to determine angle and side measurements. They will learn to use proportions to find the lengths of similar triangles.

A.SSE.1. G.CO.2, G.CO.3, G.CO.4, G.CO.5, G.CO.6, G.CO.10, G.SRT.1, G.SRT.2, G.SRT.3, G.SRT.4

Course Outline

Unit 3 – Right Triangles and Trigonometry

3.1 Pythagorean Theorem
3.2 Special Right Triangles
3.3 Similar Right Triangles (Geometric Mean)
3.4 The Sine and Cosine Ratios
3.5 The Tangent Ratio
3.6 Solving Right Triangles

Common Core Standards

In this unit:
Students will explore the Pythagorean Theorem, which defines the relationship between the legs and hypotenuse of a right triangle. By applying the Pythagorean Theorem to special 30-60-90° and 45-45-90° triangles, they will determine a relationship between the legs and the hypotenuse of these special triangles. Using more proportionality theorems that relate right triangles within right triangles, the geometric mean and the trigonometric ratios of sine, cosine, and tangent, they will solve triangles for side lengths and angle measures.

A.SSE.1, A.CED.4, F.BF.4, , F.TF.7, G.SRT.4, G.SRT.5, G.SRT.6, G.SRT.7, G.SRT.8

Unit 4 – Circles

4.1 Introduction to Circles and Tangents
4.2 Arcs and Chords
4.3 Sector Area and Arc Length
4.4 Inscribed Angles
4.5 Angle Relationships in Circles
4.6 Segment Relationships in Circles
4.7 Coordinate Circles

In this unit:
Students will learn circle vocabulary such as secant, tangent, and chord. They will apply the relationships between secants and radii, as well as between central angles, arc measures, congruent chords and arcs to find arc and chord measurements. They will learn to compute the area of a sector and the length of an arc in a circle. Using the definition and the properties of an inscribed angle as well as the relationship between the angles of intersecting chords and secants, they will determine chord and angle measurements. They will write the equation of a circle in a coordinate plane and graph a circle given an equation.

A.SSE.1, A.CED.2, A.CED.4, G.CO.1, G.SRT.11, G.C.2, G.C.3, G.C.4, G.C.5, G.GPE.1

Course Outline

Unit 5 – Volume

5.1 Area of a Circle
5.2 Areas of Regular Polygons
5.3 Surface Area and Volume of Prisms and Cylinders
5.4 Volume and Surface Area of Pyramids
5.5 Surface Areas and Volumes of Cones
5.6 Surface Areas and Volumes of Spheres

Common Core Standards

In this unit:
Students will build on their knowledge of area and circumference of a circle, to solve practical problems. They will learn to find the area of any polygon using traditional methods as well as trigonometry. They will find the volume and surface area of a prism and cylinder and apply their formulas in real-world scenarios. They will apply the relationship between a pyramid and a cube, to find the formula for volume and surface area of pyramids with square, triangular and other bases. They will find the volume and surface area of a cone and a sphere and use this information to determine height and base of a three-dimensional object.

N.Q.1, A.SSE.1, A.CED.4, G.GPE.7, G.GMD.3, G.GM.1, G.GM.2

Unit 6 – Understanding Probability

6.1 Sample Spaces and Probability
6.2 Permutations and Combinations
6.3 Independent and Dependent Events
6.4 Two Way Tables and Probability
6.5 Probability of Disjoint and Overlapping Events
6.6 Geometric Probability

In this unit:
Students will learn multiple strategies to help identify a sample space and populations. They will learn to count outcomes of a sample space using permutations and combinations. They will apply their knowledge of probability to compare and contrast independent and dependent events. They will find the probability for two dependent overlapping events, and distinguish between overlapping and disjoint events. They will apply properties of probability to determine geometric outcomes.

N.Q.1, S.CP.1, S.CP.2. S.CP.3, S.CP.4, S.CP.5, S.CP.6, S.CP.7, S.CP.9