Portable Assisted Study Sequence

Geometry A

SCOPE

Plane and solid geometry are examined visually, analytically, and logically. Constructions are made with a compass and straight edge and by folding paper. Geometric concepts beginning with basic points, lines, planes, angles, and rays are developed along with properties of parallel and perpendicular lines as a basis for the study of polygons. Triangles and triangle properties are studied. Similarities and differences between polygons are addressed using a hierarchical approach. Area, perimeter, and volume connect plane and solid geometry. Students are taught to use definitions, axioms, and postulates to justify conjectures.

The focus and goals of the geometry sequence are concept based and designed to help students think logically and analytically. Making sense of the world through geometry is a priority.

SEQUENCE

UNIT 1 – Foundations

1. Inscribed Angles
2. Angle Formed by a Tangent and a Chord
3. Angles Formed by Two Intersecting Chords
4. Angles Formed by Secants and Tangents
5. Concurrent Lines
6. Regular Inscribed Polygons
7. Regular Circumscribed Polygons
8. Ratio and Proportion and Parallel Line Proportionality
9. Proportionality and Parallelism
10. Visualizing Three-Dimensional Objects
11. Perspective
12. Sketch Geometric Models
13. Proofs

UNIT 2 – Congruent Triangle Theorems & Constructions

1. Proofs
2. Side-Angle-Side Theorem
3. Angle-Side-Angle Theorem
4. Isosceles Triangle Theorems
5. Converse of the Isosceles Triangle Theorem
6. Side-Side-Side Theorem
7. Introduction to Constructions
8. Triangle Constructions
9. Conditions That Are Or Are Not Sufficient To Prove Triangles Congruent
10. Perpendicular Bisector Theorem
11. More Constructions
12. Right Triangle Theorem I
13. Right Triangle Theorem II

SEQUENCE

UNIT 3 – Parallel, Perpendicular, & Angle Theorems

1. Exterior Angles
2. Lines Perpendicular to the Same Line
3. Lines Perpendicular to Parallel Lines and Non-Euclidean Geometries
4. Transversals and Parallel Lines
5. Interior Angles and Corresponding Angle Theorems
6. The Sum of the Angles in a Triangle
7. Equal Segments Theorem
8. Points on the Bisector of an Angle
9. Angle Comparisons
10. Mid-Segments
11. The Median in a Right Triangle
12. Triangles with Unequal Sides
13. Triangles with Unequal Angles
14. Comparing Triangles

UNIT 4 – Perimeter, Area, and Volume

1. Perimeter
2. Area
3. Connection Between Perimeter and Area
4. Area of Parallelograms
5. Area of Triangles
6. Area of Trapezoids
7. Area of Regular Polygons
8. Surface Area of Prisms
9. Surface Area of Cylinders and Spheres
10. Surface Area of Pyramids and Cones
11. Volume of Prisms
12. Volume of Pyramids
13. Volume of Cylinders, Cones, and Spheres
14. Effects of Changing Dimensions

UNIT 5 – Properties of Common Geometric Shapes

1. Hierarchy of Polygons and How This Relates to Their Properties
2. Properties of Special Parallelograms
3. Sufficient Conditions for a Parallelogram
4. Parallelogram Constructions
5. Sufficient Conditions for Rectangles, Rhombi, and Squares
6. Isosceles Trapezoids
7. Constructing Trapezoids
8. Trigonometric Ratios
9. Right Triangle Applications and Properties of Special Right Triangles
10. Identities
11. Law of Cosines
12. Law of Sines