

E3 STEM ACADEMY
Engage-Enhance-Excel
Geometry- Course Outline

UNIT 1: Foundations of Geometry

- Points lines and planes
- Segment Addition & Midpoint
- Analyze Constructions
- Angle Measure and Analyze Angle Construction
- Angle Pairs

UNIT 2: Reasoning

- Inductive reasoning and conjecture
- linear and quadratic patterns
- conditional statements
- Biconditionals
- Deductive reasoning
- postulates
- algebraic proofs

UNIT 3: Proofs

- Flowchart and Paragraph Proofs
- Whole Proofs
- Properties and definitions
- Reasons and conclusions

UNIT 4: Parallel and Perpendicular Lines

- Parallel Lines & Transversals
- Parallel lines and Finding Angle Measures
- Slopes of Lines
- Equations of Lines, Slope-Intercept, Point-Slope & Standard Form
- Equations of Perpendicular Lines
- Proving Lines Parallel & Construct Parallel Lines
- Proving Lines Parallel and Angle Relationships
- Perpendiculars and Distance

UNIT 4: Congruent Triangles

- Classifying Triangles
- Angles of triangles

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- Proving triangles congruent
- Isosceles and equilateral triangles congruency proofs

UNIT 5: Triangle Relationships

- Perpendicular bisector and Median
- Special segments
- Inequalities in triangles
- Triangle inequality theorem
- Inequalities with 2 triangles

UNIT 6: Quadrilaterals

- Angles of polygons
- Properties of parallelograms
- Properties of rectangles
- Properties of rhombi and squares
- Trapezoids and kites
- Quadrilateral proofs

UNIT 7: Similar Triangles

- Ratio and proportions
- Similar polygons
- Similar triangles proofs
- Midsegments parallel lines and proportional parts

UNIT 8: Trigonometry

- Special Right Triangles
- Geometric mean
- Trig finding sides of a triangle
- Angles of elevation and depression
- Law of Sine
- Law of cosines
- Applications of Law of Sine and Law of Cosines

UNIT 9: Transformations

- Translations
- Reflections and symmetry
- Rotations

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- Dilations
- Vectors

UNIT 10: Circles

- Circumference and pi
- Angles and arcs
- Radian & Arc Length
- Measuring angles and arcs
- Inscribed angles
- Tangents
- Secants, tangents, angle measures
- Special segments
- Equations of Circles

UNIT 11: Area

- Area of parallelograms and triangles
- Area of trapezoids, rhombi and kites
- Area of circles and sectors
- Area of regular polygons
- Area of polygons with circles and segments

UNIT 12: Surface Area and Volume

- Cross sections, rotational solids, 3D figures
- Surface area of prisms
- Surface area of pyramids
- Surface area and volume of cylinders
- Surface areas and volumes of cones and spheres

UNIT 13: Probability

- Geometric Probability
- Permutations and combinations
- Independent and dependent Variables