**Geometry MAT 240 AC**

**(Common Core Regents)**

**Resource(s) used:**

**Primary: Teacher written lessons**

**Secondary: Glencoe McGraw Hill Geometry**

**Secondary: eMathInstruction (online resource)**

**Secondary: Amsco Math A and Math B**

**Course Syllabus**

This course is intended to be the first course in mathematics for high school freshmen already accepted in the NFCSD Accelerated Program. Students are expected to have taken and passed the Integrated Algebra course and Regents Final Exam in Preparatory School. In this course, students will have the opportunity to make conjectures about geometric situations and prove, in a variety of ways, both formally and informally, that their conclusion follows logically from their hypothesis. This course is meant to employ an integrated approach to the study of geometric relationships. Integrating synthetic, transformational, and coordinate approaches to geometry, students will justify geometric relationships and properties of geometric figures.

**Final Assessment:** Students are required to take a NYS Regents exam in Geometry. Successful completion of this exam is part of the requirement for a Regents with Distinction Diploma in NYS.

**10 – Week Marking Period**

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| **Lesson** | **Topic(s)** | **New York State Common Core**  **Standards** |
| **0** | Review: Key Facts and Discoveries from Earlier Grades |  |
| **1** | Construct an Equilateral Triangle | **G.CO.12** |
| **2** | Construct a Copy of an Angle  Construct a Bisector of an Angle | **G.CO.12** |
| **3** | Construct a Perpendicular Bisector | **G.CO.12** |
| **4** | Points of Concurrency  (Circumcenter and Incenter) | **G.CO.12, G.C.2** |
| **5** | Construction Practice | **G.CO.12** |
| **6** | Solving for Unknown Angles   * Angles and Lines at a Point | **G.CO.1** |
| **7** | Solving for Unknown Angles   * Transversals | **G.CO.1** |
| **8** | Solving for Unknown Angles   * Angles in a Triangle | **G.CO.1** |
| **9** | Constructing Parallel Lines, Medians and Altitudes | **G.SRT.5, G.CO.10** |
| **10** | Constructing Quadrilaterals | **G.CO.10, G.CO.11** |
| **11** | Miscellaneous Constructions | **G.CO.1** |
| **12** | Coordinate Rules and Input/Output | **G.CO.A2** |
| **13** | Mapping, Functions & Transformations,  One-to-One Functions | **G.CO.A2** |
| **14** | Isometries | **G.CO.A2** |
| **15** | Reflectional and Rotational Symmetry | **G.GPE.4, G.CO.5** |
| **16** | Properties of Transformations & Notation | **G.CO.2** |
| **17** | Reflections | **G.GPE.4, G.CO.5** |
| **18** | Constructing Reflections | **G.GPE.4, G.CO.5** |
| **19** | Rotations | **G.CO.4, G.CO.5, G.CO.9** |
| **20** | Translations | **G.GPE.4, G.CO.5** |
| **21** | Constructing Translations | **G.GPE.4, G.CO.5** |
| **22** | Coordinate Rules | **G.GPE.4, G.CO.5** |
| **23** | Double Reflections over Parallel Lines | **G.GPE.4, G.CO.5** |
| **24** | Double Reflections over Intersecting Lines | **G.GPE.4, G.CO.5** |
| **25** | Compositions of Functions | **G.GPE.4** |
| **26** | Rigid Motions, Correspondence, Congruence | **G.GPE.4, G.CO.5, G.SRT.2, G.SRT.3** |
| **27** | Definition of Congruence | **G.GPE.4, G.CO.5, G.SRT.2, G.SRT.3** |
| **28** | Preparing for Triangle Proofs  (Triangle Congruence Criteria) | **G.CO.9, G.CO.10** |
| **29** | Preparing for Triangle Proofs  (Triangle Congruence Criteria) | **G.CO.9, G.CO.10** |
| **30** | Writing Geometry Proofs | **G.CO.9, G.CO.10** |

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**20 – Week Marking Period**

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| **Lesson** | **Topic(s)** | **New York State**  **Common Core Standards** |
| **31** | Triangle Congruency Proofs | **G.CO.10** |
| **32** | Triangle Congruency Proofs - Practice | **G.CO.10** |
| **33** | Triangle Proofs Involving   * Altitude, Median and Isosceles | **G.CO.10** |
| **34** | Proofs Involving 2 Pairs of Congruent Triangles | **G.CO.9, G.CO.10** |
| **35** | Triangle Congruency Proofs   * Practice too | **G.CO.9, G.CO.10** |
| **36** | Finding Quadrilateral Properties | **G.GPE.4, G.GPE.5** |
| **37** | Using Quadrilateral Properties | **G.GPE.4, G.GPE.5** |
| **38** | The Triangle Midsegment Theorem | **G.CO.10, G.CO.11** |
| **39** | The Centriod Theorem | **G.CO.10, G.CO.11** |
| **40** | Coordinate Rule for Dilations | **G.SRT.1** |
| **41** | Constructing Dilations | **G.SRT.1** |
| **42** | What Does it Mean to be Similar? | **G.SRT.2** |
| **43** | Solving Ratio Problems | **G.SRT.5** |
| **44** | Similarity Transformations | **G.SRT.4, G.SRT.5** |
| **45** | Similarity of Triangles | **G.SRT.5, G.CO.10** |
| **46** | Triangle Similarity Proofs | **G.SRT.4, G.SRT.5** |
| **47** | Side Splitting and Angle Bisector Theorem | **G.SRT.4, G.SRT.5** |
| **48** | Altitude Drawn to the Hypotenuse of a Right Triangle (Geometric Mean) | **G.SRT.5, G.GPE.6** |

**Geometry MAT 240 AC**

**(Common Core Regents)**

**30 – Week Marking Period**

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| **Lesson** | **Topic(s)** | **New York State**  **Common Core Standards** |
| **48** | Altitude Drawn to the Hypotenuse of a Right Triangle (Geometric Mean) | **G.SRT.5, G.GPE.6** |
| **49** | Multiplying and Dividing Radical Expressions | **G.SRT.6, G.SRT.7** |
| **50** | Adding and Subtracting Radical Expressions | **G.SRT.6, G.SRT.7** |
| **51** | Similarity and Trigonometry Activity | **G.SRT.6** |
| **52** | Trigonometry Basics  Definition of Sine, Cosine and Tangent | **G.SRT.6, G.SRT.7** |
| **53** | Sine and Cosine of Complementary Angles | **G.SRT.6, G.SRT.7** |
| **54** | Solving Trigonometric Word Problems | **G.SRT.6, G.SRT.7** |
| **55** | Draw a Diagram to Solve Trigonometric Word Problems | **G.SRT.6, G.SRT.7** |
| **56** | More Advances Trigonometric Word Problems | **G.SRT.6, G.SRT.7, G.SRT.8** |
| **57** | Trigonometry – Systems of Equations | **G.SRT.6, G.SRT.7, G.SRT.8** |
| **58** | Areas of Triangles and Parallelograms | **G.SRT.6, G.SRT.7, G.SRT.8** |
| **59** | Using the Law of Sines to Find a Missing Side | **G.SRT.6, G.SRT.7, G.SRT.8** |
| **60** | Using the Law of Sines to Find a Missing Angle | **G.SRT.6, G.SRT.7, G.SRT.8** |
| **61** | Solving Real-Word Triangle Problems | **G.SRT.6, G.SRT.7, G.SRT.8** |
| **62** | Properties of Area and Circumference | **G.GMD.1, G.MG.1, G.MG.2, G.MG.3** |
| **63** | The Scaling Principle for Area  General Prisms, Cylinders, Pyramids, Cones and Their Cross-Sections | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **64** | Properties of Volume  Scaling Principle for Volume | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **65** | Volume of Prisms and Cylinders  Cavalieri’s Principle | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **66** | Volume of Pyramids and Cones | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **67** | Volume of Sphere’s and Hemisphere’s | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **68** | Real-World 3-D Problems | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **69** | Rotating Cross Sections to Form Solids | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **70** | Applying Slope, Distance and Midpoint | **G.GPE.4, G.GPE.5** |
| **71** | Parallel and Perpendicular Lines | **G.GPE.4, G.GPE.5** |
| **72** | Solving Parallel and Perpendicular Lines   * Perpendicular Bisector Equation | **G.CO.9, G.CO.10** |
| **73** | Coordinate Geometry Proofs | **G.GPE.4, G.GPE.5** |
| **74** | Partitioning a Line Segment | **G.GPE.4** |
| **75** | Perimeter and Area on the Coordinate Plane | **G.GPE.7, G.MG.2, G.MG.3, G.MG.1** |

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**40 – Week Marking Period**

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| **Lesson** | **Topic(s)** | **New York State**  **Common Core Standards** |
| **76** | Chord, Radius, Arcs, Tangents, Central Angles, Intercepted Arcs, Parallel Chords, Tangent Circles | **G.C.2, G.GPE.1, G.GPE.5, G.CO.12** |
| **77** | Inscribed Angles in Circles | **G.C.2** |
| **78** | Angle Relationships in Circles | **G.C.2** |
| **79** | Arc Length and Areas of Sectors | **G.C.2** |
| **80** | Segment Relationships in Circles | **G.C.2** |
| **81** | Multipart Circle Problems | **C.G.2, G.GPE.1** |
| **82** | Equation of a Circle and Completing the Square | **G.GPE.1** |
|  | Regents Exam Review |  |

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**Resource(s) used:**

**Primary: eMathInstruction (online resource)**

**Secondary: Teacher written lessons**

**Secondary: Glencoe McGraw Hill Geometry**

**Secondary: Amsco Math A and Math B**

**Course Syllabus**

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| --- | --- | --- |
| **Lesson** | **Topic(s)** | **New York State Common Core**  **Standards** |
|  | **UNIT 1 – ESSENTIAL GEOMETRIC TERMS AND CONCEPTS – 9 LESSONS** |  |
| **1** | Points, Distances and Segments | **G.CO.1** |
| **2** | Lines, Rays and Angles | **G.CO.1** |
| **3** | Types of Angles | **N/A** |
| **4** | Complements and Supplements | **N/A** |
| **5** | Circles and Arcs | **G.CO.1** |
| **6** | Constructing a Triangle Given its Sides | **G.CO.12** |
| **7** | Additional Geometric Terminology | **G.CO.1** |
| **8** | More Properties of Lines | **N/A** |
| **9** | Additional Unit #1 Practice | **G.CO.1, G.CO.12** |
|  |  |  |
|  | **UNIT 2 – TRANSFORMATIONS, RIGID MOTIONS AND CONGRUENCE – 9 LESSONS** |  |
| **1** | Transformations | **G.CO.2** |
| **2** | Rotations | **G.CO.4, G.CO.5, G.CO.9** |
| **3** | Reflections | **G.CO.4, G.CO.5** |
| **4** | Isosceles Triangles | **G.CO.5, G.CO.9, G.CO.10** |
| **5** | Translations | **G.CO.4, G.CO.5, G.CO.9** |
| **6** | Congruence and Rigid Motions | **G.CO.5, G.CO.6, G.CO.7** |
| **7** | Basic Rigid Motion Proofs | **G.CO.6, G.CO.7, G.CO.9** |
| **8** | Congruence Reasoning About Triangles | **G.CO.6, G.CO.7, G.CO.8** |
| **9** | Symmetries of a Figure | **G.CO.3** |
|  | **UNIT 3 – EUCLIDEAN TRIANGLE PROOF – 10 LESSONS** |  |
| **1** | Drawing Inferences from Givens | **N/A** |
| **2** | The Axioms of Equality | **G.CO.9** |
| **3** | Triangle Congruence Theorems | **G.CO.10** |
| **4** | CPCTC | **G.CO.10** |
| **5** | Proofs with Partitioning | **G.CO.10** |
| **6** | Parallel Properties Review | **G.CO.10** |
| **7** | More Work with Parallel Lines | **G.CO.9** |
| **8** | AAS and Isosceles Triangles | **G.CO.10** |
| **9** | Hypotenuse-Leg | **G.CO.10** |
| **10** | Additional Triangle Proof | **G.CO.9, G.CO.10** |
|  | **UNIT 4 – CONSTRUCTIONS – 7 LESSONS** |  |
| **1** | Introduction to Constructions | **G.CO.12** |
| **2** | Constructing Angles and Parallel Lines | **G.CO.12** |
| **3** | Constructing Perpendicular Lines | **G.CO.12** |
| **4** | The Circumscribed Circle | **G.CO.12, G.C.3** |
| **5** | Bisecting an Angle | **G.CO.12** |
| **6** | The Inscribe Circle of a Triangle | **G.CO.12, G.C.3** |
| **7** | Inscribing Regular Polygons | **G.CO.13** |
|  | **UNIT 5 – THE TOOLS OF COORDINATE GEOMETRY – 11 LESSONS** |  |
| **1** | Slope and Parallelism | **G.GPE.4, G.GPE.5** |
| **2** | Slope and Perpendicularity | **G.GPE.4, G.GPE.5** |
| **3** | Equations of Lines | **G.GPE.4, G.GPE.5** |
| **4** | The Point-Slope Form of a Line | **G.GPE.4, G.GPE5** |
| **5** | Horizontal and Vertical Lines | **N/A** |
| **6** | The Pythagorean Theorem | **G.GPE.4, G.SRT.8** |
| **7** | The Distance Formula | **G.GPE.4** |
| **8** | The Midpoint Formula | **G.GPE.4** |
| **9** | Rotations in the Coordinate Plane | **G.GPE.4, G.CO.5** |
| **10** | Reflections in the Coordinate Plane | **G.GPE.4, G.CO.5** |
| **11** | Translations in the Coordinate Plane | **G.GPE.4, G.CO.5** |
|  | **UNIT 6 – QUADRILATERALS – 8 LESSONS** |  |
| **1** | Trapezoids and Parallelograms | **G.CO.11** |
| **2** | Properties of Parallelograms | **G.CO.11** |
| **3** | What Makes a Parallelogram | **G.CO.11** |
| **4** | The Midpoint of a Triangle | **G.CO.10, G.CO.11** |
| **5** | Rectangles | **G.CO.11** |
| **6** | The Rhombus | **G.CO.11** |
| **7** | Squares | **G.CO.11** |
| **8** | Additional Quadrilateral Practice | **G.CO.10, G.CO.11** |
|  | **UNIT 7 – DILATIONS AND SIMILARITY – 12 LESSONS** |  |
| **1** | Dilations | **G.SRT.1** |
| **2** | Dilations in the Coordinate Plane | **G.SRT.1** |
| **3** | Dilations and Angles | **G.SRT.1** |
| **4** | Similarity | **G.SRT.2** |
| **5** | Similarity Criteria | **G.SRT.3** |
| **6** | Reasoning with Similarity | **G.SRT.5** |
| **7** | More Similarity Reasoning | **G.SRT.5** |
| **8** | The Side Splitter Theorem | **G.SRT.4, G.SRT.5** |
| **9** | Partitioning a Line Segment | **G.SRT.5, G.SRT.6** |
| **10** | The Medians of a Triangle | **G.SRT.5, G.CO.10** |
| **11** | Right Triangles and Similarity | **G.SRT.5** |
| **12** | Proving the Pythagorean Theorem  (no homework) | **G.SRT.4, G.SRT.5** |
|  | **UNIT 8 – RIGHT TRIANGLE TRIGONOMETRY – 6 LESSONS** |  |
| **1** | Similar Right Triangles | **G.SRT.6** |
| **2** | The Trigonometric Ratios | **G.SRT.6, G.SRT.7** |
| **3** | Trigonometry and the Calculator | **G.SRT.6, G.SRT.7** |
| **4** | Solving for Missing Sides of Right Triangles | **G.SRT.8** |
| **5** | Trigonometric Applications | **G.SRT.8** |
| **6** | More Trigonometric Applications | **G.SRT.8** |
|  | **UNIT 9 – CIRCLE GEOMETRY – 12 LESSONS** |  |
| **1** | Circle Terminology | **G.C.2** |
| **2** | Inscribed Angles | **G.C.2** |
| **3** | More Work with Inscribed Angles | **G.C.2** |
| **4** | Intersecting Chords | **G.C.2** |
| **5** | Tangents to a Circle | **G.C.2** |
| **6** | Tangents, Secants and Their Angles | **G.C.2** |
| **7** | Tangent and Secant Proofs and Practice | **G.C.2** |
| **8** | Secant and Tangent Lengths | **G.C.2** |
| **9** | Equations of Circles | **G.GPE.1** |
| **10** | Placing Circles in Standard Form | **G.GPE.1** |
| **11** | Constructing Tangents | **G.CO.12** |
| **12** | Equations of Tangent Lines | **G.GPE.5** |
|  | **UNIT 10 – MEASUREMENT AND MODELING – 11 LESSONS** |  |
| **1** | Perimeter | **G.GPE.7, G.MG.2, G.MG.3** |
| **2** | The Circumference of a Circle | **G.GMD.1, G.MG.1, G.MG.3** |
| **3** | The Area of Polygons | **G.GPE.7, G.MG.1, G.MG.2, G.MG.3** |
| **4** | The Area of a Circle | **G.GMD.1, G.MG.1, G.MG.2, G.MG.3** |
| **5** | Sectors of Circles | **G.C.5, G.MG.1, G.MG.2, G.MG.3** |
| **6** | Radian Measure of Angles | **G.C.1, G.C.5** |
| **7** | Solids and Their Cross Sections | **G.GMD.4** |
| **8** | The Volume of Prisms and Cylinders | **G.GMD.1, G.GME.3, G.MG.1, G.MG.2, G.MG.3** |
| **9** | The Volume of Pyramids and Cones | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **10** | Spheres | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |
| **11** | The Volume of a Truncated Cone | **G.GMD.1, G.GMD.3, G.MG.1, G.MG.2, G.MG.3** |