Table of Contents

Unit 1: Transformations in the Coordinate Plane
- **Lesson 1: Introducing Transformations**
  - Lesson 1.1.1: Defining Terms
  - Lesson 1.1.2: Transformations As Functions
  - Lesson 1.1.3: Applying Lines of Symmetry
  - **Conceptual Activities**
    - GeoGebra. "Function Transformations."
    - GeoGebra. "Draw (a) line of symmetry."
  - **Conceptual Task**
    - Transformation Tests
- **Lesson 2: Rotations, Reflections, and Translations**
  - Lesson 1.2.1: Defining Rotations, Reflections, and Translations
  - Lesson 1.2.2: Applying Rotations, Reflections, and Translations
  - **Conceptual Activity**
    - GeoGebra. "Reflections, Rotations, Dilations, and Translations."
  - **Conceptual Task**
    - The Transforming Key
- **Unit 1 Assessment**
- **Answer Key**
  - Teacher Resource/Student Workbook
- **Station Activities**
  - Set 1: Rotations and Reflections

Unit 2: Similarity, Congruence, and Proof
- **Lesson 1: Investigating Properties of Dilations**
  - Lesson 2.1.1: Investigating Properties of Parallelism and the Center
  - Lesson 2.1.2: Investigating Scale Factors
  - **Conceptual Activities**
    - GeoGebra. "Dilation Exploration."
    - Desmos. "Working with Dilations."
- **Lesson 2: Defining and Applying Similarity**
  - Lesson 2.2.1: Defining Similarity
  - Lesson 2.2.2: Applying Similarity Using the Angle-Angle (AA) Criterion
  - **Conceptual Activity**
    - GeoGebra. "Similar Figures: Dynamic Illustration."
  - **Conceptual Task**
    - Similarity Investigation

Lesson 3: Proving Similarity
Lesson 2.3.1: Proving Triangle Similarity Using Side-Angle-Side (SAS) and Side-Side-Side (SSS) Similarity
Lesson 2.3.2: Working with Ratio Segments
Lesson 2.3.3: Proving the Pythagorean Theorem Using Similarity
Lesson 2.3.4: Solving Problems Using Similarity and Congruence
Conceptual Activity
GeoGebra. "Prove Similarity Theorems."
Lesson 4: Exploring Congruence
Lesson 2.4.1: Describing Rigid Motions and Predicting the Effects
Lesson 2.4.2: Defining Congruence in Terms of Rigid Motions
Conceptual Activity
GeoGebra. "Congruence by Rigid Motions."
Lesson 5: Congruent Triangles
Lesson 2.5.1: Triangle Congruency
Lesson 2.5.2: Triangle Congruence Criteria
Conceptual Activity
GeoGebra. "Congruence of triangles."
Conceptual Task
Decoration Dilemma
Lesson 6: Proving Theorems About Lines and Angles
Lesson 2.6.1: Proving the Vertical Angles Theorem
Lesson 2.6.2: Proving Theorems About Angles in Parallel Lines Cut by a Transversal
Conceptual Activity
Desmos. "Lines, Transversals, and Angles."
Conceptual Task
Triangulating a Waterspout
Lesson 7: Proving Theorems About Triangles
Lesson 2.7.1: Proving the Interior Angle Sum Theorem
Lesson 2.7.2: Proving Theorems About Isosceles Triangles
Lesson 2.7.3: Proving the Midsegment of a Triangle
Lesson 2.7.4: Proving Centers of Triangles
Conceptual Task
String Games
Lesson 8: Proving Theorems About Parallelograms
Lesson 2.8.1: Proving Properties of Parallelograms
Lesson 2.8.2: Proving Properties of Special Quadrilaterals
Lesson 9: Constructing Lines, Segments, and Angles
Lesson 2.9.1: Copying Segments and Angles
Lesson 2.9.2: Bisecting Segments and Angles
Lesson 2.9.3: Constructing Perpendicular and Parallel Lines

Lesson 10: Constructing Polygons
Lesson 2.10.1: Constructing Equilateral Triangles Inscribed in Circles
Lesson 2.10.2: Constructing Squares Inscribed in Circles
Lesson 2.10.3: Constructing Regular Hexagons Inscribed in Circles
Conceptual Activities
GeoGebra. "Hexagon-Construction."
GeoGebra. "Equilateral Triangle Construction (Dynamic Illustration)."
Unit 2 Assessment
Answer Key
Teacher Resource/Student Workbook
Station Activities
Set 1: Similarity and Scale Factor
Set 2: Corresponding Parts, Transformations, and Proof
Set 3: Special Congruent Triangles
Set 4: Parallel Lines and Transversals
Set 5: Rhombi, Squares, Kites, and Trapezoids

Unit 3: Right Triangle Trigonometry
Lesson 1: Exploring Trigonometric Ratios
Lesson 3.1.1: Defining Trigonometric Ratios
Lesson 3.1.2: Exploring Sine and Cosine As Complements
Conceptual Activities
GeoGebra. "Right Triangle Trigonometry: Intro."
MathIsFun.com. "Sine, Cosine and Tangent."
Conceptual Task
Illustrative Mathematics. "Mt. Whitney to Death Valley."
Lesson 2: Applying Trigonometric Ratios
Lesson 3.2.1: Calculating Sine, Cosine, and Tangent
Lesson 3.2.2: Calculating Cosecant, Secant, and Cotangent
Lesson 3.2.3: Problem Solving with the Pythagorean Theorem and Trigonometry
Conceptual Tasks
High Altitude Trigonometry
Triangles? Yeah, Right
Unit 3 Assessment
Answer Key
Teacher Resource/Student Workbook
Station Activities
Set 1: Sine, Cosine, and Tangent Ratios, and Angles of Elevation and Depression

Unit 4: Circles and Volume

Lesson 1: Introducing Circles

Lesson 4.1.1: Similar Circles and Central and Inscribed Angles

Lesson 4.1.2: Chord Central Angles Conjecture

Lesson 4.1.3: Properties of Tangents of a Circle

Conceptual Activities

GeoGebra. "Tangent to Circle: Construction 1."

Math Warehouse. "What Is the Tangent of a Circle?"

Conceptual Task

Moon Horizons

Lesson 2: Inscribed Polygons and Circumscribed Triangles

Lesson 4.2.1: Constructing Inscribed Circles

Lesson 4.2.2: Constructing Circumscribed Circles

Lesson 4.2.3: Proving Properties of Inscribed Quadrilaterals

Conceptual Activities

GeoGebra. "Circumcircle: Construction Exercise (VA)."

GeoGebra. "Construct Equilateral Triangle Inscribed in a Circle."

Conceptual Task

Circle Constructions

Lesson 3: Constructing Tangent Lines

Lesson 4.3.1: Constructing Tangent Lines

Conceptual Activity

IXL Learning. "Tangent lines."

Lesson 4: Finding Arc Lengths and Areas of Sectors

Lesson 4.4.1: Defining Radians

Lesson 4.4.2: Deriving the Formula for the Area of a Sector

Conceptual Activity

Conceptual Activity: Sector Area

Conceptual Task

Circle Investigation

Lesson 5: Explaining and Applying Area and Volume Formulas

Lesson 4.5.1: Circumference and Area of a Circle

Lesson 4.5.2: Volumes of Cylinders, Pyramids, Cones, and Spheres

Conceptual Task

House of Sand

Lesson 6: Relationships Between Two- and Three-Dimensional Objects
Lesson 4.6.1: Cross Sections and Rotated Shapes
Conceptual Activities
GeoGebra. "Conic Sections."
GeoGebra. "Sections of Cubes."
GeoGebra. "Sections of Spheres."
GeoGebra. "Sections of Cones."
GeoGebra. "Sections of Triangular Pyramids."
GeoGebra. "Sections of Rectangular Pyramids."
GeoGebra. "Sections of Cylinders."
GeoGebra. "Sections of Triangular Prisms."
Conceptual Task
Desmos. "Building Conic Sections."
Unit 4 Assessment
Answer Key
Teacher Resource/Student Workbook
Station Activities
Set 1: Circumference, Angles, Arcs, Chords, and Inscribed Angles
Set 2: Circumcenter, Incenter, Orthocenter, and Centroid

Unit 5: Geometric and Algebraic Connections
Lesson 1: The Equation of a Circle
Lesson 5.1.1: Deriving the Equation of a Circle
Lesson 5.1.2: Using Coordinates to Prove Geometric Theorems About Circles
Conceptual Activities
Desmos. "Circle Patterns."
GeoGebra. "Circle Equation: Center NOT (0, 0)."
GeoGebra. "Similar Circles?"
Lesson 2: Slope and Distance
Lesson 5.2.1: Using Coordinates to Prove Geometric Theorems with Slope and Distance
Lesson 5.2.2: Working with Parallel and Perpendicular Lines
Conceptual Activity
Desmos. "Slopes of Parallel and Perpendicular Lines."
Conceptual Task
The Town Square

Lesson 3: Lines and Line Segments

Lesson 5.3.1: Calculating Perimeter and Area

Lesson 5.3.2: Midpoints and Other Points on Line Segments

Conceptual Activities

Desmos. "Build a Bigger Field."

IXL Learning. "Points, lines, and segments: Midpoint formula."

Lesson 4: Geometric Modeling

Lesson 5.4.1: Density

Lesson 5.4.2: Design

Unit 5 Assessment

Answer Key

Teacher Resource/Student Workbook

Station Activities

Set 1: Special Segments, Angle Measurements, and Equations of Circles

Set 2: Parallel Lines, Slopes, and Equations

Set 3: Perpendicular Lines

Set 4: Coordinate Proof with Quadrilaterals

Set 5: Geometric Modeling

Unit 6: Applications of Probability

Lesson 1: Events

Lesson 6.1.1: Describing Events

Lesson 6.1.2: The Addition Rule

Lesson 6.1.3: Understanding Independent Events

Conceptual Activity

MathIsFun.com. "Probability: Independent Events."

Conceptual Task

Gym Survey Analysis

Lesson 2: Conditional Probability

Lesson 6.2.1: Introducing Conditional Probability

Lesson 6.2.2: Using Two-Way Frequency Tables

Conceptual Activities

Illustrative Mathematics. "The Titanic 3."

GeoGebra. "Conditional probability."

Conceptual Task

Allergies and Probabilities

Unit 6 Assessment

Answer Key

Teacher Resource/Student Workbook

Station Activities

Set 1: Probability