Unit 1: Segments, length and area

Date	Lesson title	Topics	Extension topics
9/8	1.1 Segment length, vocabulary	Length, number lines; points, segments; measuring centimeters, inches, feet	Absolute value
9/9	1.2 Segment addition	Postulate, collinear; algebraic conventions, prior knowledge	Algebra with fractional coefficients
9/12	1.3 Geometric objects	Lines, rays, planes, coplanar	Efficient solutions to algebra equations
9/13	1.4 Midpoint and bisector	Congruence, hash marks; solve equations with variables on both sides	Trisection
9/15	1.5 Equilateral $\triangle$, isosceles $\triangle$, perimeter	Special triangles and quadrilaterals; calculate perimeter	Find endpoint given midpoint
9/16	1.6 Review	Roundtable of peers: Terms, perimeter, modeling, algebra solving	
9/19	1.7 Unit conversion	Inches $\rightleftarrows$ feet, inches $\rightleftarrows$ centimeters, formula sheet use	
9/19	1.7 Exit Note Quiz: Length and perimeter	Use algebra to solve simple distance problems, vocabulary and notation	Absolute value, solve for endpoint, algebra
9/20	1.8 Area	Rectangle, triangle, parallelogram area; units, solving for missing dimension	Scientific notation
9/22	1.9 Rounding, circles	Area of a circle, circumference, π, decimals, compound figures	Sig figs
9/23	1.10 Precision	Percent error formula	Confidence intervals
9/28	1.11 Review	Roundtable peers: Length, area and perimeter, % error, solving algebra	
9/30	1.12 Test: Length and area	Using algebra to solve, conventions, precision and rounding	Confidence intervals, absolute value, scientific notation

12 Instructional days (1-12 / 159)

Unit 2: Angles

Date	Lesson title	Topics	Extension topics
10/3	2.1 Angle measures	Terminology, notation, 90°, 180°, 360°, measuring with protractor	Algebra with absolute values review
10/4	2.2 Angle addition, pairs	Adjacent, linear, complementary, supplementary	Clock problems
10/7	2.3 Vertical angles	Opposite angles	Proof vertical $\angle$s $\cong$
10/11	2.4 Angle bisector	Congruence, hash marks; solving equations	Bearings
10/12	2.5 Equilateral and isosceles $\triangle$s	Special triangles, isosceles base theorem	Radian units
10/13	2.6 Review	Roundtable: Terms, protractor use, algebraic modeling, triangle situations	
10/14	2.7 Test: Angles	Using algebra to solve, conventions, precision and rounding	Bearings, radians

7 Instructional days (13-19 / 159)

Unit 3: Transversals

Date	Lesson title	Topics	Extension topics
10/17	3.1 Parallel lines	Identifying transversal angles, parallel and perpendicular definitions	Ratios
10/18	3.2 Finding angle measures	Modeling with algebra, solve	Ratio partition
10/20	3.3 Triangle sum	Derivation, auxilary lines, aper folding model	Non-Euclidean geometries
10/21	3.4 Parallelograms	Definitions, opposite sides $\cong$	Deltamath ramp-up
10/24	3.5 External angles	$\triangle$ external angles	
10/25	3.6 Transversal situations	Multiple steps: angle pairs, isosceles $\triangle$s	Polygon internal angles
10/27	3.7 Review	Roundtable: Transversal naming conventions, solving for angles, parallelograms, situations	
10/28	3.8 Test: Transversals	Parallel line situations, implications for polygons	

8 Instructional days (20-27 / 159)

Unit 4: Volume and polyhedra

Date	Lesson title	Topics	Extension topics
10/31	4.1 Nets of prisms	Definitions, folding	
11/1	4.2 Surface area	Rectangular prisms	Wooden cube models
11/3	4.3 Volume	Prisms, cubes, units	
11/4	4.4 Solve for a side	Algebra application, rectangular prisms, solve for area of base	
11/7	4.5 Exponent review	Squaring, cubic, radicals	Exponent rules
11/10	4.6 Spheres, cones, pyramids	Volume formulas, solve for parameter	Simplifying radicals
11/14	4.7 2-D Density	Population density, cost calculations	(dilution problems)
11/15	4.8 Weight	Density calculations of a volume, multi-step problems	
11/17	4.9 Review	Roundtable:	
11/21-22	4.10 Test: Volume and polyhedra	online Deltamath, printed problem set	

11 Instructional days (28-38 / 159)

Unit 5: Pythagorean theorem

Date	Lesson title	Topics	Extension topics
11/28	5.1 Geometry software	Graspable Math introduction	
11/29	5.2 Algebraic form	Exponent review	
11/30	5.3 Coordinate plane	Distance formula, standard position, Square roots	(3-D formula)
12/1	5.4 Solve for a leg	Geometric proof project, video	(Higher orders, simplify radicals)
12/2	Distance applications	Pythagorean theorem word problems	
12/5	5.6 Review	Number line and angle addition, area and volume	Density
12/6	5.7 Test	Year-to-date skills (no distance calculations)	

7 Instructional days (39-45 / 159)

Unit 6: Analytic geometry

Date	Lesson title	Topics	Extension topics
12/8	6.1 Midpoint formula	Coordinate plane, midpoint as average	3-D midpoint
12/9	6.2 Linear equations	Slope-intercept form, graphing, gradient	
12/12	6.3 Standard form	Algebraic conversion in both directions, vertical and horizontal, $f(x)$ notation	Domain and range, (open and closed endpoints, inequality and interval notation)
12/13	6.4 Slopes: $\parallel$, $\perp$	Negative reciprocals, geometric interpretation as 90° rotation	Point-slope form
12/15	6.5 Review	linear equations and graphs	
12/16	6.6 Quiz	linear equations and graphs, $\parallel$, $\perp$, slope-intercept and standard forms	
1/3	6.7 Systems	Substitution and t-charts, Graspable Math graphing	algebraic solutions
1/4	6.8 Applications	Word problems, two variables	
1/6	6.9 Applications	Graphing word problems, quiz of linear equations	
1/9	6.10 Midpoint formula	Distance, Review	Ratio partition
1/10	6.11 Point-slope form	Conversion to slope-intercept	$\tan\theta$ (radians)
1/12	6.12 Review	Linear equations, systems, applications	
1/13	6.13 Test	Graphing, rate of change, algebraic conversion, parallel and perpendicular slopes	Line through a point, point-slope

13 Instructional days (46-58 / 159)

Unit 7: Congruence transformations

Date	Lesson title	Topics	Extension topics
1/17	7.1 Translation	Rigid motion, isometry, notation, construct equilateral $\triangle$	Vectors
1/18	7.2 Reflection	Orientation, invariance	Construct $\perp$ bisector
1/20	7.3 Rotation	Center, direction, magnitude in degrees	Centered away from the origin
1/23	7.4 Triangle correspondences [Regents?]	SSS	Proving congruence
1/24	7.5 Triangle congruencies [Regents?]	ASA, SAS	Reflexive property
1/25	7.6 "Onto" mappings [Regents?]	Rotational symmetry, regular polygons	
1/27	7.7 Symmetry	Bilateral symmetry, compositions	Proof of isosceles base theorem
1/31	7.8 Review		
2/1	7.9 Test	Translation, reflection, rotation, $\triangle$ congruencies	

9 Instructional days (59-67 / 159)

Unit 8: Project

Date	Lesson title	Topics	Extension topics
1/5	7.1 Pick a topic		
1/6	7.2 Outline, Intro		
1/7	7.3 Diagrams		
1/8	7.4 Text body		
1/9	7.5 Diagrams		Mock Regents (YTD)
1/12	7.6 Text body	Early finishers: compass, flower of life design	
1/13	7.7 Peer review		
1/14	7.8 Revision		
1/15	7.9 Presentations		
1/16	7.10 Presentations		

10 Instructional days (68-77 / 159)

Unit 9: Dilation

Date	Lesson title	Topics	Extension topics
1/17	9.1 Dilation	Triangle graphing, angle correspondence	
1/18	9.2 Scale factor		Dilations not centered at the origin
1/19	9.3 Overlapping triangles		
1/20	9.4 Compositions		
1/23	9.5 Scale maps		
1/31	9.6 Project	Cuba and Taiwan comparision	
2/1	9.7 Presentations		
2/2	9.8 Review		
2/3	9.9 Test		

9 Instructional days (74-82 / 159)

Unit 10: Similarity and proportion

Date	Lesson title	Topics	Extension topics
2/6	10.1 Midline, median		Centroid, median partition
2/7	10.2 Similarity situations		
2/8	10.3 Overlapping $\triangle$ composition	Reflection and dilation, overlapping $\triangle$	
2/9	10.4 Area and volume scaling		
2/10	10.5 Algebraic modeling		$\triangle$s in circles, angles
2/13	10.6 Applications of scale		Chord lengths
2/14	10.7 Project		Secant triangle angles
2/15	10.8 Presentations		Secant lengths
2/16	10.9 Review		
2/17	10.10 Test		

10 Instructional days (83-92 / 159)

Unit 11: Circle angles, sectors, arcs

Date	Lesson title	Topics	Extension topics
2/27	11.1 Arc length	Circumference, central angle, rotation, radius, diameter	Radians
2/28	11.2 Sector area	Exact and decimal calculations	Circle equations
3/1	11.3 Inscribed polygons	Regular polygon area	Segment area
3/2	11.4 Inscribed angles	Chords, inscribed angle theorem	Completing the square
3/3	11.5 Secants, tangents	Tangent $\perp$ radius, circumscribed	
3/6	11.6 Pie charts	Data presentation	Incenter and circumcenter
3/7	11.7 Project		
3/8	11.8 Presentations	Completing the square (calculator)	
3/9	11.9 Review		
3/10	11.10 Test		

10 Instructional days (93-102 / 159)

Unit 12: Trigonometry

Date	Lesson title	Topics	
3/13	12.1 Tangent	Slope, angle of rotation, graphing, Pythagorean triples	
3/14	12.2 Tan inverse		Radians
3/15	12.3 Tangent applications	Angle of elevation, declination	3-D situations
3/16	12.4 Sine and cosine	SOHCAHTOA	
3/17	12.5 Inverse functions		
3/20	12.6 Special triangles		Complementary angle theorem
3/21	12.7 Project		
3/22	12.8 Presentations		
3/23	12.9 Review		
3/24	12.10 Test		

10 Instructional days (103-112 / 159)

Unit 13: Quadrilaterals

Date	Lesson title	Topics	
3/27	13.1 Parallelograms	Sides, angles properties	
3/28	13.2 Diagonals	Congruent triangle implications, bisectors	
3/29	13.3 Rectangles and squares	Congruent diagonals	
3/30	13.4 Rhombus	Perpendicular diagonals, perimeter	
3/31	13.5 Kites	Perimeter	
4/3	13.6 Quadrilateral circle inscription	Angle properties	
4/4	13.7 Review		
4/5	13.8 Test		

8 Instructional days (113-120 / 159)

Unit 14: Function transformations

Date	Lesson title	Topics	
4/17	14.1 Translations	Graphing	
4/28	14.5 Test	Linear, polynomial, reciprocal, exponential, periodic	

9 Instructional days (113-120 / 159)

Unit 15: IB Trigonometry

Date	Lesson title	Topics	
5/1	15.1 Sine $\triangle$ area formula		
5/2	15.2 Sine rule		
5/3	15.3 Cosine rule		
5/4	15.4 Review	Roundtable	
5/5	15.5 Test		
5/8	15.6 IB Prior learning assessment		

[6] Instructional days (113-120 / 159)

Application contexts

- Classroom diagram, desk layout and dimensions (proctoring instructions reference)
- Maps: NYC streets, US states, historic treks (Lewis & Clark, Sherman, Ponz de Leon)
- Ordinal number lines: Supreme Court justices
- Curved number lines: clocks, parlimentary diagrams

Project ideas

- Rate of change, Interpretations of slope
- Numberlines
  - Dates: 1492, 1776, 1969
  - Silk Road distance by latitude, Gibralter to Tokyo
  - Timelines of civilizations
  - Supreme Court justices
  - Curved clock face
  - Curved parlimentary party split

Tech skills progression

1. Graph paper, graphing, scale drawing
2. Origami
3. 3-D paper or stick models (glue guns)
4. Geogebra drawing figures, angle measures
5. GraspableMath algebraic notation
6. Map reading, latitude and longitude, distance
7. Desmos analytic geometry, functions

Curves unit exploration

1. Conics
2. Exponentials
3. Catenaries