Course Title	Content Area	Grade Level:	Credit (if applicable)
Geometry & Statistics ACA/ACC	Math	9-10	1.0

Course Description

Students build on their middle school study of transformations of figures. Using definitions of congruence and similarity, students prove the triangle congruence and similarity theorems. Students apply these theorems to prove results about quadrilaterals, isosceles triangles, and other figures. Students extend their understanding of similarity to right triangle trigonometry in this course and to periodic functions in future courses.

Next, students derive volume formulas and study the effect of dilation on both area and volume. They use coordinate geometry to connect ideas from algebra and geometry. Students review theorems, skills, and functions from prior units and reconsider them, using the structure of the coordinate plane. Students use transformations and the Pythagorean Theorem to build equations of circles, parabolas, parallel lines, and perpendicular lines from definitions, and students link transformations to the concept of functions.

Nearing the end of the course, students analyze relationships between segments and angles in circles and develop the concept of radian measure for angles, which will be built upon in subsequent courses. Students close the year by extending what they learned about probability in grade 7 to consider probabilities of combined events and to identify when events are independent.

Illustrative Math Information for Families: https://accessim.org/9-12-aga/geometry?a=family

Aligned Core Resources

Geo & Stats Lesson Materials TEACHER (2026)

https://accessim.org/9-12-aga/geometry/course-guide?a=teacher

CT Core Standards

Imagine Learning iM Resources (BPS teacher login through ClassLink)

https://accessim.org/9-12-aga/geometry/course-guide/further-reading?a=teacher

- Empowering All Storytellers: Tips for Engaging Special Populations Using IM® v.360 for Grade 6–12
- Tackling Wordy Problems: How the Three Reads Math Language Routine Supports Access for All Learners
- Think Pair Share
- Math Language Routines: Discourse with a Purpose
- Unlocking Learners' Thinking Using the Mathematical Language Routines
- A Circumference By Any Other Name . . .

Link to *Equity Audit*

Equity Curriculum Review Audit (Stats & Geo 2026)

Connection to the *BPS Vision of the Graduate*

Common Core State Standards: Math Practice (MP) Standards

MP 1: Make sense of problems and persevere in solving them.
MP 2: Reason abstractly and quantitatively.
MP 3: Construct viable arguments and critique the reasoning of others.
MP 4: Model with mathematics.
MP 5: Use appropriate tools strategically.
MP 6: Attend to precision.
MP 7: Look for and make use of structure.
MP 8: Look for and express regularity in repeated reasoning.

	Lessons that Showcase Math Practice Standards							
	MP 1	**MP 2**	**MP 3**	**MP 4**	**MP 5**	**MP 6**	**MP 7**	**MP 8**
Unit 1	1-7	4, 5, 7	2-5	7	1	2-7	1-7	2-5
Unit 2A	3-5	1-5	3-5	-	5	3-5	1-5	1-2
Unit 2	6-8	1-4	1-8	6-8	6	3-8	1-3	3-4
Unit 3	2, 4, 8	2-2	7	2, 6, 8	8	1-8	1-5	3-7
Unit 4	1-8	2-6	-	5-7	3-7	1-7	4-6	4-6
Unit 5	2, 3, 5	5	1, 2, 5	5	2, 5, 6	2, 5	6	4
Unit 6	3, 5	-	2, 5	-	3, 5	1–3	5, 6	4
Unit 7	1, 4	1, 3, 4	2, 3	-	-	1	2, 1	4
Unit 8	-	1 -3, 5, 6	2, 5	4 - 6	1, 3 - 5	1 - 5	1, 2, 4, 5	3, 5

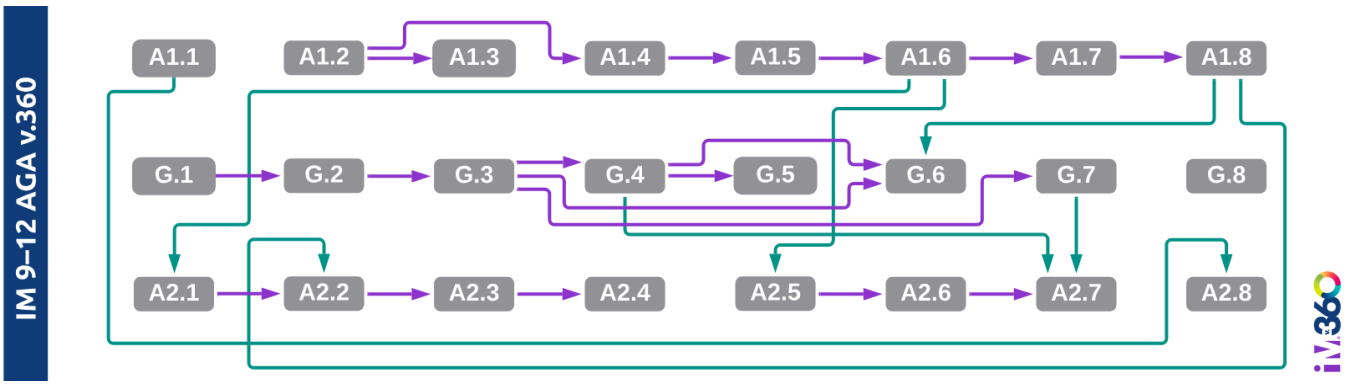
Bristol Public Schools Vision of the Graduate

Problem Solving
- iM's focus on real-world modeling and problem-solving strategies
- Multiple solution pathways are encouraged and explored
- Students develop perseverance through challenging tasks

Critical Thinking
- Students analyze mathematical relationships and justify their reasoning
- Regular opportunities to critique others' reasoning
- Emphasis on understanding "why" not just "how"

Communication and Collaboration
- Structured mathematical discourse is built into lessons
- Students explain their thinking both verbally and in writing
- Many activities involve partner and group work

Additional Course Information: *Knowledge/Skill Dependent courses/prerequisites*



Standard Matrix

Standard	Unit								
	1	2A	2	3	4	5	6	7	8
HSA-CED.A.2 *Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*					✓	✓			
HSA-CED.A.4 *Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.*			✓	✓		✓			
HSA-REI.C.7 *Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.*						✓			
HSA-SSE.A.1 *Interpret expressions that represent a quantity in terms of its context.*							✓		
HSA-SSE.A.1.a *Interpret parts of an expression, such as terms, factors, and coefficients.*					✓	✓			
HSA-SSE.A.1.b *Interpret complicated expressions by viewing one or more of their parts as a single entity.*					✓		✓		
HSA-SSE.A.2 *Use the structure of an expression to identify ways to rewrite it.*						✓			
HSA-SSE.B.3 *Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*						✓			
HSF-IF.C.7 *Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*						✓			
HSF-IF.C.7.b *Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.*						✓			
HSF-IF.C.9 *Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).*					✓				
HSG-C.A.1 *Prove that all circles are similar.*			✓						
HSG-C.A.2 *Identify and describe relationships among inscribed angles, radii, and chords.*						✓	✓		
HSG-C.A.3 *Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.*							✓		
HSG-C.B.5 *Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of*							✓		

proportionality; derive the formula for the area of a sector.									
HSG-CO.A.1 *Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.*	✓	✓				✓			
HSG-CO.A.2 *Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not.*				✓			✓		
HSG-CO.A.3 *Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.*									
HSG-CO.A.4 *Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.*									
HSG-CO.A.5 *Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.*		✓				✓			
HSG-CO.B.6 *Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.*		✓							
HSG-CO.B.7 *Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.*		✓							
HSG-CO.B.8 *Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.*		✓							
HSG-CO.B.9 *Prove theorems about lines and angles.*	✓								
HSG-CO.C.9 *Prove theorems about lines and angles (vertical angles are congruent; parallel lines cut by a transversal; perpendicular bisector properties).*		✓				✓			
HSG-CO.C.10 *Prove theorems about triangles (interior angle sum; base angles of isosceles triangles are congruent; midsegments; medians).*	✓	✓	✓	✓	✓	✓			
HSG-CO.C.11 *Prove theorems about parallelograms (opposite sides/angles congruent; diagonals bisect each other; rectangle diagonals congruent).*	✓	✓							
HSG-CO.D.12 *Make formal geometric constructions with a variety of tools and methods (copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines).*	✓								
HSG-CO.D.13 *Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.*									
HSG-GMD.A.1 *Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.*					✓	✓			
HSG-GMD.A.3 *Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*					✓				
HSG-GMD.B.4 *Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.*					✓				
HSG-GPE.A.1 *Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.*						✓	✓		
HSG-GPE.B.4						✓			

Use coordinates to prove simple geometric theorems algebraically.									
HSG-GPE.B.5 *Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.*						✓			
HSG-GPE.B.6 *Find the point on a directed line segment between two given points that partitions the segment in a given ratio.*						✓			
HSG-GPE.B.7 *Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.*						✓			
HSG-MG.A.1 *Use geometric shapes, their measures, and their properties to describe objects.*	✓	✓		✓	✓		✓		
HSG-MG.A.2 *Apply concepts of density based on area and volume in modeling situations.*					✓				
HSG-MG.A.3 *Apply geometric methods to solve design problems.*	✓	✓	✓	✓	✓		✓		
HSG-SRT.A.1 *Verify experimentally the properties of dilations given by a center and a scale factor.*			✓						
HSG-SRT.A.1.a *A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.*			✓						
HSG-SRT.A.1.b *The dilation of a line segment is longer or shorter in the ratio given by the scale factor.*			✓						
HSG-SRT.A.2 *Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.*			✓						
HSG-SRT.A.3 *Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.*			✓						
HSG-SRT.B.4 *Prove theorems about triangles involving similarity (line parallel to one side divides the other two proportionally; Pythagorean Theorem proved using similarity).*	✓		✓						
HSG-SRT.B.5 *Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.*			✓	✓		✓	✓		
HSG-SRT.C.6 *Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.*				✓					
HSG-SRT.C.7 *Explain and use the relationship between the sine and cosine of complementary angles.*				✓					
HSG-SRT.C.8 *Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*				✓	✓		✓		
HSN-Q.A.1 *Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.*			✓		✓	✓			
HSN-Q.A.2 *Define appropriate quantities for the purpose of descriptive modeling.*				✓					
HSN-Q.A.3 *Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*		✓	✓	✓					
HSS-CP.A.1 *Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").*								✓	
HSS-CP.A.2								✓	

Understand that two events A and B are independent if the probability of both occurring together is the product of their probabilities, and use this characterization to determine if they are independent.									
HSS-CP.A.3 *Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.*								✓	
HSS-CP.A.4 *Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.*								✓	
HSS-CP.A.5 *Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.*								✓	
HSS-CP.B.6 *Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.*								✓	
HSS-CP.B.7 *Apply the addition rule, P(A or B) = P(A)+P(B) - P(A and B) and interpret the answer in terms of the model.*								✓	
HSS-ID.A.1 *Represent data with plots on the real number line (dot plots, histograms, and box plots).*									✓
HSS-ID.A.2 *Use statistics appropriate to the shape of the distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more data sets.*									✓
HSS-ID.A.3 *Interpret differences in shape, center, and spread in context, including the effects of outliers.*									✓
HSS-ID.B.5 *Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.*								✓	

Unit Links

Geometry ACA/ACC
- Unit 1: Tools for Geometry (~8 blocks)
- Unit 2A: ACC Congruence (~7 blocks)
- Unit 2: Similarity (~12 blocks)
- Unit 3: Right Triangle Trigonometry (~9 blocks)
- Unit 4: Solid Geometry (~10 blocks)
- Unit 5: Coordinate Geometry (~9 blocks)
- Unit 6: Circles (~8 blocks)
- Unit 7: One Variable Statistics (~ 8 blocks)
- Unit 8: Conditional Probability (~6 Blocks)

Use of Instructional Time
(181 School Days = 90 blocks)
- Unit 1 - 8 blocks
- Unit 2A - 7 blocks (ACC only)
- Unit 2 - 12 blocks
- Unit 3 - 9 blocks
- Unit 4 - 10 blocks
- Unit 5 - 9 blocks
- Unit 6 - 8 blocks
- Unit 7 - 6 blocks
- Unit 8 - 8 blocks

ACC 77 blocks
ACA 70 blocks

At the teacher's discretion, remaining time will be utilized for creating a math community and responding to student performance on formative assessments. Additionally, time will be allotted for assessment review days (both to prepare for an assessment and to provide student feedback after an assessment).

Unit Title

Unit 1: Tools for Geometry - BPS Unit (~8 blocks)

Relevant Standards

G.CO.A.1 G.CO.B.9 G.CO.C.10
G.CO.C.11 G.CO.C.12 G.MG.A.1 G.MG.A.3

Essential Question(s)	Enduring Understanding(s)
• How do we use precise language and notation to communicate geometric ideas? • What relationships exist between angles formed by intersecting lines? • How can we determine if a set of measurements forms a valid geometric figure? • Why do angle measures in polygons follow predictable patterns? ***ACC Only*** • How do we know a statement is true in geometry—what is the difference between observing a pattern and proving it? • How do definitions, postulates, theorems, and corollaries work together to build geometric knowledge? • What role does logical reasoning play in constructing valid geometric arguments?	• Precise notation and language are essential for communicating and understanding geometric relationships. • Angles formed by intersecting lines have predictable relationships that can be used to solve problems and find unknown measures. • The sum of angles in any polygon follows a formula that depends only on the number of sides. • Triangles have special properties (angle sum, isosceles, inequality) that constrain their possible measurements. • Points and lines that divide figures into equal parts have special properties and applications. • The relationship between angle measures determines which side is longest and which angles are largest. ***ACC Only*** • Geometric truths can be established through logical reasoning, building from definitions and postulates to theorems. • Geometry is built on a foundation of undefined terms, definitions, postulates (assumptions), and theorems (proven statements). • Valid proofs require each statement to follow logically from previous statements, justified by definitions, postulates, or prior theorems.

Demonstration of Learning	Pacing for Unit

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	8 Blocks (80 minute lessons)

Family Overview (link below)	Integration of Technology
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets

Unit-specific Vocabulary		Aligned Unit Materials, Resources, and Technology (beyond core resources)
Complementary angles Supplementary angles Vertical angles Transversal Corresponding angles Alternate interior angles Triangle inequality theorem Midpoint	***ACC Only*** Undefined term Definition Postulate (or axiom) Theorem Corollary Conjecture Proof	N/A

Bisector Angle bisector Alternate exterior angles Perpendicular bisector Consecutive interior angles	Two-column proof Deductive reasoning Inductive reasoning	

Opportunities for Interdisciplinary Connections	Anticipated misconceptions
• Physics: Angle of incidence equals angle of reflection (vertical angles, supplementary angles) • Art: Perspective Drawings - Using angle relationships and parallel lines to create realistic depth • Geography: Using triangle properties to estimate distances on maps • Language Arts: Logical Arguments - Proof writing develops the same logical structure as persuasive essays or debates • Language Arts: Technical Writing - Learning to write clearly and justify claims is essential in many fields	• Using vertical angles for any two angles that look opposite. • Assuming corresponding or alternate angles are congruent without a parallel-line statement. • Believing the angle sum of every polygon is 360°. • Checking only one pair of sides for the Triangle Inequality (for example, 2 + 3 > 4 is enough). • Thinking complementary or supplementary angles must be adjacent. • Believing any line through a midpoint is the perpendicular bisector.

Connections to Prior Units	Connections to Future Units
• Grade 4: Point, line, segment, ray, angle • Grade 4-6: Degree measure • Grade 4-8: Parallel lines, perpendicular lines • Grade 6-7: Congruence • Grade 5-7: Triangle types (scalene, isosceles, equilateral, acute, right, obtuse) • Grade 3, 5-7: Quadrilaterals • Grade 7: complementary and supplementary angles and solving for unknown angle measures • Grade 8: angle relationships with parallel lines and transversals, and the triangle angle sum • Grade 8: linear equations, used to solve for unknown angles written as algebraic expressions.	• Unit 2A (ACC Congruence) and Unit 2 (Similarity): vertical, parallel-line, and triangle angle relationships justify congruent angles and the AA similarity criterion. • Unit 2 (Similarity), Lessons 7-8 (ACC): the Angle Bisector Theorem extends the angle bisector ideas from this unit. • Unit 3 (Trigonometry): complementary angles in a right triangle explain why the sine of one acute angle equals the cosine of the other. • Unit 5 (Coordinate Geometry): the midpoint from Lesson 6 and the perpendicular bisector idea reappear in coordinate form. • Unit 6 (Circles): the polygon angle sum from Lesson 5 supports the angle relationships of inscribed quadrilaterals.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Geometric Notation Scavenger Hunt" matching physical architectural structures (beams, corners, laser paths) to their formal symbols.	Interactive digital word wall and symbol decoder card displaying visual diagrams, symbolic names, and verbal descriptions side-by-side	Label a complex architectural blueprint digitally, build a physical pipe-cleaner diagram with written notation keys, or record a video walkthrough naming objects.
LT2	"Dynamic Angle Slider Lab" using GeoGebra or Desmos where moving one beam dynamically updates surrounding angle measures to uncover static sum patterns.	Color-coded angle pair graphic organizers highlighting adjacent vs. non-adjacent pairs and visual equation templates.	Solve multi-step angle puzzles using a choice of algebraic equation steps, narrated screen recordings, or physical equation-building tiles.
LT3	"City Street Grid Analysis" mapping parallel avenues and transversal streets to locate congruent traffic light angles and turn lanes.	Transparent color-coded overlays that slide along transversals to visually demonstrate how corresponding angles align directly on top of each other.	Create a digital decision tree flowchart or record a video explaining how to determine whether two lines are parallel based on given angle measurements.
LT4A	"Building Rules vs. Discoveries Debate" categorizing game rules (postulates/definitions) vs. strategies proven to always work (theorems).	Hierarchical taxonomy map with distinct visual icons categorizing Undefined Terms → Definitions → Postulates (assumed) → Theorems (proven).	Sort statement cards into correct logical categories using a drag-and-drop digital board or defend card placements in a peer Socratic circle.

LT5A	"Geometry Courtroom" role-play where students act as attorneys presenting step-by-step evidence to prove vertical angles or parallel lines "beyond a reasonable doubt."	Scaffolded two-column proof templates paired with a visual "Reason Bank" detailing allowed postulates, definitions, and prior theorems.	Construct proofs using a choice of physical statement/reason puzzle strips, digital flowchart proofs, or formal written two-column proofs.
LT6	"Rigid Structure Challenge" testing which combination of three side lengths or angle measures forms a valid, unshakeable triangle using physical strips.	Interactive dynamic applet showing the 180° tear-off angle sum visualization alongside formula cheat-sheets for Isosceles and Equilateral properties.	Solve missing side and angle tasks using a choice of written algebraic problem sets, digital whiteboard walkthroughs, or physical manipulative demonstrations.
LT7	"Structural Design Audit" evaluating why bridges and cranes use diagonal braces to turn quadrilaterals into rigid shapes.	Quadrilateral family tree infographic displaying nested properties (parallelograms, rectangles, rhombi, squares, trapezoids) with marked side/angle tick marks.	Construct an interactive geometry presentation or design a digital property-matching game that calculates unknown interior angles and side lengths.
LT8	"Map Logistics & Delivery Hub Challenge" finding the exact midpoint between two emergency response centers to minimize travel distance.	Step-by-step visual construction guide mapping segment bisectors and angle bisectors with color-coded congruent halves.	Demonstrate midpoint and bisector calculations using paper-folding (origami) proofs, digital compass/straightedge software constructions, or algebraic equation steps.
LT9A	"Axiomatic System Puzzle" analyzing what happens to geometric truths if a postulate is removed or changed (e.g., Euclidean vs. Non-Euclidean geometry).	Comparative matrix contrasting the origin, proof requirement, and logical hierarchy of geometric statements across polygon and triangle properties.	Create a digital infographic flowchart or record an audio podcast explaining how a new polygon theorem relies on underlying triangle postulates.
LT10A	"Mythbusters: Geometric Edition" investigating unproven geometric conjectures about triangles and quadrilaterals to confirm or disprove them logically.	Visual flowchart proof templates mapping the logical progression from Given Hypotheses → Intermediate Triangle Properties →Final Polygon Claim.	Deliver a formal written two-column proof, present an oral defense of a geometric proof, or create a video step-by-step proof breakdown.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can match geometric figures (points, lines, segments, rays, angles) to their correct symbols and names using visual reference cards.	I can name and label geometric objects (points, lines, segments, rays, angles) using proper symbols and sentence frames.	I can fluently translate between visual diagrams, written descriptions, and formal geometric notation for points, lines, segments, rays, and angles.
LT2	I can identify complementary, supplementary, vertical, and adjacent angles on a diagram using color-coding and visual guides.	I can set up simple equations to solve for missing angle measures using angle relationship templates and sentence frames.	I can solve multi-step algebraic problems to find missing angle measures and justify the geometric relationships used in writing.
LT3	I can identify matching parallel line angle pairs (alternate interior, corresponding, etc.) on a labeled diagram using color-coded cards.	I can use parallel line angle rules to find unknown angle measures using visual guides and sentence starters.	I can calculate unknown angle measures formed by parallel lines cut by a transversal and justify my reasoning using formal angle theorems.
LT4A	I can sort geometry statements into categories (definitions, postulates, theorems) using picture cards and a visual word bank.	I can distinguish between definitions, postulates, theorems, and corollaries using graphic organizers and sentence starters.	I can evaluate and explain the structural differences between definitions, postulates, theorems, and corollaries in mathematical logic.
LT5A	I can place pre-written proof steps in order using a visual flowchart and picture clues.	I can complete two-column geometry proofs using a given bank of statements and reasons with sentence frames.	I can construct independent, formal geometric proofs (two-column, paragraph, or flow proof) to justify geometric relationships.
LT6	I can label angle sums and side relationships on a triangle diagram using visual reference sheets.	I can calculate missing angles and sides of triangles using triangle theorems (Triangle Angle Sum, Isosceles Triangle Theorem) and step-by-step guides.	I can apply advanced triangle theorems and properties algebraically to calculate unknown side and angle measures with full written justifications.

LT7	I can sort shapes (parallelograms, rectangles, rhombuses, squares, trapezoids) and match their sides/angles to visual property cards.	I can use quadrilateral properties to find unknown side lengths and angle measures using structured templates and sentence starters.	I can write and solve algebraic equations to determine missing side and angle measures in various quadrilaterals, justifying each step with shape properties.
LT8	I can label the midpoint of a segment or the bisector of an angle on a diagram using visual markers.	I can write equations to find unknown segment lengths and angle measures using midpoint and bisector definitions with step-by-step frames.	I can solve multi-step algebraic equations involving segment/angle bisectors and midpoints, providing written explanations of my solutions.
LT9A	I can sort geometry statements into categories (definitions, postulates, theorems) using picture cards and a visual word bank.	I can distinguish between definitions, postulates, theorems, and corollaries using graphic organizers and sentence starters.	I can evaluate and explain the structural differences between definitions, postulates, theorems, and corollaries in mathematical logic.
LT10A	I can place pre-written proof steps in order using a visual flowchart and picture clues.	I can complete two-column geometry proofs using a given bank of statements and reasons with sentence frames.	I can construct independent, formal geometric proofs (two-column, paragraph, or flow proof) to justify geometric relationships.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1** I can use proper geometric notation and symbols (points, lines, segments, rays, angles) to identify and name geometric objects **Learning Target #2** I can use angle relationships to find missing measures. **Learning Target #3** I can use parallel line angle relationships to find unknown angle measures **Learning Target #4A** ***ACC Only*** I can distinguish between definitions, theorems, postulates, and corollaries **Learning Target #5A** ***ACC Only*** I can use logical arguments to prove geometric relationships.	**Lesson 1** • I can identify and define geometric objects • I can correctly label points, lines, segments, and rays using proper notation when given a diagram • I can name an angle three ways (vertex as middle point, or using three points) • I can measure angles and correctly classify them by type • I can identify parallel, perpendicular, and intersecting lines in a figure • ***ACC Only*** I can explain the difference between a definition and a postulate with examples • ***ACC Only*** I can identify whether a given statement is a definition, theorem, postulate, or conjecture, and justifies reasoning **Lesson 2** • I can identify complementary pairs (sum = 90°) and supplementary pairs (sum = 180°) in diagrams • I can write and solves linear equations of the form ax+b=c to find unknown angle measures • I can identify vertical angles formed by two intersecting lines • I can state that vertical angles are congruent and use this to find missing angle measures • I can solve multi-step problems involving two or more angle relationships • ***ACC Only*** I can write a formal proof that vertical angles are congruent using the definition of supplementary angles • ***ACC Only*** I can justify each step of their proof using definitions, postulates, or previously proven theorems • ***ACC Only*** I can apply the vertical angles theorem to solve more complex geometric configurations **Lesson 3** • I can identify and label corresponding, alternate interior, alternate exterior, and consecutive interior angles • I can state properties: corresponding angles are congruent, alternate interior angles are congruent, consecutive interior angles are supplementary • I can use angle properties and relationships to write and solve linear equations (2x+10=3x−5) to find angle measures • I can determine if two lines are parallel by checking if given

		angle pairs have the expected relationship • I can solve applied problems (e.g., finding angles in architectural designs with parallel lines) • ***ACC Only*** I can prove that corresponding angles are congruent (using properties of parallel lines and transversals) • ***ACC Only*** I can prove that alternate interior angles are congruent (using corresponding angles and vertical angles) • ***ACC Only*** I can explain why consecutive interior angles must be supplementary (using linear pairs and congruent angles) • ***ACC Only*** I can write formal proofs justifying why lines are parallel given angle relationships
Section B	**Learning Target #6** I can use theorems and properties of triangles to find angle and side measures. **Learning Target #7** I can use properties of quadrilaterals to find angle and side measures. **Learning Target #8** Use properties of midpoints and bisectors to find unknown angle and segment measures. **Learning Target #9A** ***ACC Only*** I can distinguish between definitions, theorems, postulates, and corollaries **Learning Target #10A** ***ACC Only*** I can use logical arguments to prove geometric relationships.	**Lesson 4** • I can find unknown angle measures of a triangle using the fact that all three interior angles sum to 180° • I can solve multi-step linear equations to find unknown angles (e.g., x+(x+20)+(x+10)=180) • I can classify triangles by both angle and side properties • I can use the isosceles triangle theorem to find unknown angles and sides • ***ACC Only*** I can prove the triangle sum theorem. • ***ACC Only*** I can prove the isosceles triangle theorem and its converse. **Lesson 5** • I can find unknown angle measures of a quadrilateral using the fact that all four interior angles sum to 360° • I can classify quadrilaterals by properties • I can solve linear equations with multiple steps to find angles in quadrilaterals • I can identify properties of special quadrilaterals (rectangles, rhombi, squares) and use them to find angles • ***ACC Only*** I can prove the quadrilateral angle sum theorem by dividing a quadrilateral into triangles • ***ACC Only*** I can explain why the formula is 360° by connecting it to the triangle sum theorem • ***ACC Only*** I can extend my reasoning to find angle sums in other polygons (pentagons, hexagons, etc.) **Lesson 6** • I can identify angle bisectors in diagrams and state that they divide an angle into two congruent parts • I can use angle bisector properties to find unknown angle measures • I can identify midpoints and the congruent segments formed by a midpoint of a line segment. • I can recognize midpoints and segment bisectors and use them to find segment lengths • ***ACC Only*** I can construct a perpendicular bisector and an angle bisector • ***ACC Only*** I can prove that all points on a perpendicular bisector are equidistant from the endpoints • ***ACC Only*** I can prove that an angle bisector divides the opposite side in the ratio of the adjacent sides (angle bisector theorem) **Lesson 7** • I can determine which side of a triangle is longest based on opposite angle measures. • I can check whether three given lengths can form a triangle by testing all three inequalities • I can find the range of possible values for the third side of a

		triangle • I can solve applied problems involving triangle inequality (e.g., "Can a ladder of length 20 reach a wall 18 ft away?") • ***ACC Only*** I can prove the triangle inequality theorem using the exterior angle theorem or distance properties • ***ACC Only*** I can prove that larger angles have longer opposite sides (and conversely) • ***ACC Only*** I can apply these theorems to prove properties of special triangles (isosceles, equilateral)

End of Unit Assessment

- Combine procedural skills (finding angles, solving equations) with conceptual understanding (explaining why theorems work)
- ***ACC Only:*** Include proofs. Separate scoring for proof reasoning, mathematical precision, and justification of steps

Unit Title	
Unit 2A (iM U2): Congruence (~7 blocks) ***ACC Only***	
Relevant Standards: Bold indicates priority	
G.CO.A.1 G.CO.A.5 G.CO.B.6 G.CO.B.7 G.CO.B.8 G.CO.C.9 G.CO.C.10 G.CO.C.11 G.MG.A.1 G.MG.A.3 N.Q.A.3	
Essential Question(s)	**Enduring Understanding(s)**
• What must be true about two triangles before we can say they are congruent? • How can a rigid motion show that two figures are congruent? • Why must a valid congruence criterion be established before we use corresponding parts? • How do we build a logical argument in which every claim is justified?	• Congruent figures have the same size and shape, which can be shown through rigid motions or by matching corresponding sides and angles. • Triangles are congruent when a specific set of three parts matches (SSS, SAS, ASA, or AAS); other combinations, such as SSA, do not guarantee congruence. • Once triangles are proven congruent, all of their corresponding parts are congruent (CPCTC). • A two-column proof is a logical argument in which each statement is justified by a definition, postulate, or previously proven result.
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	7 Blocks (80 minute lessons)

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Congruent figures Rigid motion Corresponding parts Congruence statement Included side Included angle SSS, SAS, ASA, AAS, CPCTC Two-column proof	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• Manufacturing and quality control: Interchangeable machine parts must be congruent to a specification, and inspectors check them against a template. • Textiles and quilting: Quilt blocks are cut as congruent triangles and squares, and pieces are sewn together along matching edges. • Architecture: Identical roof trusses and window frames are congruent, so builders can reuse one pattern. • Language arts: A two-column proof is a structured argument in which each claim needs a reason, just as	• Believing SSA or AAA proves triangles congruent. • Writing congruence statements with mismatched vertices, such as $\Delta ABC \cong \Delta EFD$ when angle A does not match angle E. • Accepting a figure as congruent because it looks the same or has tick marks, without a stated reason. • Thinking AAS requires the side to be included, or treating ASA and AAS as interchangeable. • Using CPCTC before the triangles are proven congruent. • Believing a reflection changes congruence, or that

a written argument needs evidence. • Computer-aided design: Designers copy and reflect shapes to create congruent parts for 3D printing.	congruent figures must have the same orientation.

Connections to Prior Units	Connections to Future Units
• Unit 1: triangle angle sum, vertical angles, and parallel-line angle relationships, which serve as reasons in congruence proofs. • Unit 1, Lesson 6: perpendicular and angle bisectors, which create congruent segments and angles. • Grade 8: rigid transformations (translations, reflections, rotations) and congruence described through them.	• Unit 2 (Similarity): the AA, SAS, and SSS similarity criteria mirror the congruence criteria, and CPCTC becomes corresponding sides are proportional. • Unit 5 (Coordinate Geometry): triangle proofs can be verified with coordinates and the distance formula. • Unit 6 (Circles): proofs about congruent chords, arcs, and triangles in circles use the same two-column structure.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Identical Logo Challenge" analyzing corporate logos or architectural trusses to identify identical interlocking triangles and matching parts.	Color-coded triangle congruence statements (e.g., Triangle ABC ≅ Triangle DEF) where matching vertices, angles, and sides share identical colors and tick marks.	Write six corresponding part statements (3 angles, 3 sides) from a given congruence statement, or construct a digital drag-and-drop matching puzzle.
LT2	"Rigid Structure Test" using physical snap-together geometry strips or popsicle sticks to test which combinations of 3 given parts create an unshakeable, rigid triangle.	Visual shortcut reference cards contrasting SSS (3 pairs of sides), SAS (included angle between two sides), and ASA (included side between two angles) with clear markings.	Sort diagram cards of triangle pairs into SSS, SAS, ASA, or "Not Enough Information" categories, justifying selections in writing or through an oral summary.
LT3	"Geometry Courtroom" role-play where students act as attorneys presenting step-by-step evidence to prove "beyond a reasonable doubt" that two triangles are congruent.	Scaffolded two-column proof templates paired with a "Reason Bank" (Given, Reflexive Property, Vertical Angles Theorem, Definition of Midpoint, SSS, SAS, ASA).	Complete a two-column proof by arranging physical/digital statement and reason strips, or draft a full handwritten proof from a labeled diagram.
LT4	"Land Surveyor Mystery" calculating an unreachable distance across a river or canyon by establishing congruent triangles and applying CPCTC (Corresponding Parts of Congruent Triangles are Congruent).	Flowchart proof visuals illustrating the logical chain: Given Info -> Triangle Congruence (SSS/SAS/ASA) -> CPCTC -> Final Segment/Angle Claim.	Write a complete proof utilizing CPCTC to show two segments or angles are congruent, or solve for an unknown algebraic variable using CPCTC equations.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can match corresponding angles and sides between two congruent triangles using color-coded cards and visual markers.	I can write and interpret congruence statements to list matching sides and angles using structured templates.	.I can write, interpret, and apply congruence statements to set up and solve for missing sides and angles of corresponding figures.
LT2	I can match labeled triangle diagrams to SSS, SAS, and ASA visual reference cards.	I can identify whether SSS, SAS, or ASA applies to a pair of triangles using a decision flowchart and sentence frames.	I can evaluate triangle diagrams and given information to determine and justify whether SSS, SAS, or ASA proves the triangles congruent.
LT3	I can put cut-out proof steps in order to complete a simple two-column triangle proof using picture clues.	I can fill in missing statements and reasons in a two-column triangle proof using a word/reason bank.	I can independently construct a complete two-column proof to justify whether two triangles are congruent.
LT4	I can identify CPCTC as the reason matching parts are equal after triangles are proven congruent using visual cards.	I can complete a multi-step proof using triangle congruence theorems and CPCTC using sentence starters and a reason bank.	I can construct a complete geometric proof using triangle congruence theorems and CPCTC to prove statements about specific angles and segments

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1**	**Lesson 1**

	Write, interpret, and apply congruence statements that establish corresponding parts. **Learning Target #2** Identify situations where Side-Side-Side, Angle-Side-Angle, and Side-Angle-Side Triangle Congruence Theorems apply.	• I can identify corresponding parts from a congruence statement. • I can write a congruence statement. • I can explain why if all the corresponding sides and angles of two triangles are congruent, then the triangles are congruent. **Lesson 2** • I can explore triangle congruence conjectures using technology (e.g. Desmos). • I can explain what information is needed to prove two triangles are congruent. • I can use given information to mark a diagram and determine if any triangle congruence theorems apply.
Section B	**Learning Target #3** Justify whether or not triangles are congruent by reasoning through two column proofs. **Learning Target #4** Use triangle congruence theorems and CPCTC to prove statements about angles and segments.	**Lesson 3** • I can use properties of Isosceles, Equilateral, and right triangles to determine information needed to prove triangles congruent. • I can use the Side-Side-Side and Side-Angle-Side Triangle Congruence Theorems in proofs. • I can use the Angle-Side-Angle and Angle-Angle-Side Triangle Congruence Theorem in proofs. **Lesson 4** • I can use vertical angle relationships, the reflexive property, and other angle/segment relationships to determine information needed to prove triangles congruent. • I can use the Side-Side-Side and Side-Angle-Side Triangle Congruence Theorems in proofs. • I can use the Angle-Side-Angle and Angle-Angle-Side Triangle Congruence Theorem in proofs. **Lesson 5** • I can use triangle congruence theorems to prove that two triangles are congruent, and then apply CPCTC to prove that specific corresponding sides or angles are congruent or find missing measures.
End of Unit Assessment		

Unit Title	
Unit 2 (iM U3): Similarity (~12 blocks)	
Relevant Standards: Bold indicates priority	
HSA-CED.A.4 HSG-C.A.1 HSG-CO.C.10 HSG-MG.A.3 HSG-SRT.A.1 HSG-SRT.A.1.a HSG-SRT.A.1.b HSG-SRT.A.2 HSG-SRT.A.3 HSG-SRT.B.4 HSG-SRT.B.5 HSN-Q.A.1 HSN-Q.A.3	
Essential Question(s)	**Enduring Understanding(s)**
• What makes two figures similar, and how is similarity different from congruence? • How can a scale factor describe an enlargement or a reduction? • How can proportional reasoning help us find lengths we cannot measure directly? • Which measurements are enough to prove that two triangles are similar?	• Similar figures have the same shape: corresponding angles are congruent and corresponding sides are proportional. • A dilation with scale factor k multiplies every length by k, producing a figure similar to the original. • Similar triangles allow us to find heights, distances, and other lengths indirectly through proportions. • Two pairs of congruent angles (AA), three proportional sides (SSS), or two proportional sides with a congruent included angle (SAS) guarantee similarity.
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	12 Blocks (80 minute classes)

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Dilation Center of dilation Scale factor Similar figures Similarity transformation Scaled drawing Indirect measurement AA similarity SAS similarity SSS similarity Side-splitter theorem Angle Bisector Theorem (ACC) Altitude to the hypotenuse Geometric mean	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• Cartography: Map scales apply one constant scale factor, so distances on a map are proportional to real distances. • Photography and film: Enlarging, cropping, and projecting images are dilations, and a projected	• Believing similar figures must be the same size or the same orientation. • Inverting the scale factor, such as using original length over new length. • Believing SSA establishes similarity.

image is a scaled version of the original. • Astronomy: Eratosthenes estimated Earth's circumference by comparing shadow angles at two cities, using similar triangles and proportions. • Biology and medicine: Scaled microscope images and anatomical drawings preserve proportions so measurements can be converted to real sizes. • Forestry and surveying: Shadow measurements and sighting tools use similar triangles to find the heights of trees and buildings.	• Mixing segments in the side-splitter proportion, such as comparing a segment on one side to a whole side. • Mismatching corresponding sides in a proportion, such as a short side over a long side across triangles. • Applying altitude-to-hypotenuse relationships to a triangle that is not a right triangle. •

Connections to Prior Units	**Connections to Future Units**
• Unit 2A (ACC Congruence): the congruence criteria and corresponding-parts reasoning, which the similarity criteria mirror. • Unit 1: triangle angle sum and parallel-line angles, which justify AA similarity. • Grade 7: proportional relationships and scale drawings, which introduce the scale factor idea. • Grade 8: dilations and the Pythagorean Theorem.	• Unit 3 (Trigonometry): sine, cosine, and tangent are ratios that stay constant across similar right triangles. • Unit 4 (Solid Geometry): scale factors extend to area (k^2) and volume (k^3) for similar solids. • Unit 5 (Coordinate Geometry): dilations on the coordinate plane connect proportional reasoning to slope. • Unit 6 (Circles): all circles are similar, so arc length and sector area scale with the radius scale factor.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Photo Distortion Lab" analyzing digital images stretched non-proportionally vs. scaled uniformly to discover that similar shapes preserve angles while side lengths scale.	Side-by-side visual matrix showing original vs. dilated figures with color-coded congruent angles and scale factor multiplier arrows.	Perform a digital dilation using interactive applets or construct a physical scaled drawing, explaining why corresponding angles remain equal while side lengths scale.
LT2	"Map Scale & Architectural Blueprint Challenge" calculating actual building or landscape dimensions using scaled blueprints and map keys.	Color-coded ratio match templates pairing corresponding vertices from formal similarity statements directly to side-length proportions.	Write formal similarity statements and solve proportional equations for missing sides using a choice of algebraic worksheets, digital proportion builders, or video walkthroughs.
LT3	"Indirect Measurement Outdoor Lab" using tree shadows, ground mirror reflections, or clinometers to measure the unreachable heights of flagpole or building structures.	Visual reference cards contrasting the three triangle similarity criteria (AA~, SAS~, SSS~) with highlighted angle and side requirements.	Sort diagram cards into AA~, SAS~, SSS~, or "Not Similar" categories, or write and solve algebraic equations to calculate unknown side lengths.
LT4	"Overlapping Truss & Bridge Analysis" investigating structural bridge girders and nested shadows to untangle complex overlapping shapes.	Color-coded tracing overlays that visually separate overlapping triangles or altitude-to-hypotenuse figures into standalone, aligned shapes.	Redraw separated overlapping triangles and solve for missing segment lengths using side-splitter or geometric mean proportions.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can match corresponding angles and sides between a shape and its scaled copy using color-coded cards and visual guides.	I can describe similarity by explaining that corresponding angles are equal and corresponding sides are proportional using sentence frames.	I can define similarity in terms of angle congruence and side length proportionality to describe and justify relationships between figures and their scaled copies.
LT2	I can match similar shapes to their similarity statements and fill in pre-made proportional relationships to find missing side lengths.	I can write similarity statements and set up proportions to solve for missing side lengths using calculation templates.	I can express figure similarity using formal mathematical notation and solve complex proportional equations to calculate missing measurements with written justifications.
LT3	I can sort triangle pairs into "Similar" or "Not Similar" using visual criteria cards	I can determine if two triangles are similar using similarity shortcuts (AA,	I can prove two triangles are similar using AA, SAS, or SSS similarity criteria

	(AA, SAS, SSS) and match missing side values.	SAS, SSS) and find missing measures using guided step-by-step frames.	and algebraically solve for unknown angle and side measures.
LT4	I can trace overlapping triangles in different colors on a diagram and match their corresponding parts using visual cards.	I can separate and redraw overlapping triangles to prove they are similar and calculate missing side lengths using structured templates.	I can analyze complex figures with shared sides and angles to establish triangle similarity and solve for unknown measures using formal geometric reasoning.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1** Use relationships of angles and side lengths to define similarity and describe the relationship between figures and their scaled copies. **Learning Target #2** Represent the relationship between similar figures using formal notation and use proportional relationships to solve for missing measurements.	**Lesson 1 (iM Lesson 2)** • I can make observations of properties of similar figures through scale factors and dilations. • I can dilate a figure given a scale factor and a center. • I can calculate the lengths of parts of a scaled drawing. **Lesson 2 (iM Lesson 3)** • I can explain what happens to line segments and angles in a dilation. • I know the definition of similarity. • I can write a statement of proportionality for similar figures. **Lesson 3** • I can write similarity statements. • I know the relationships between corresponding sides and angles in similar figures. • I can solve for unknown side lengths in similar figures. • I can solve for unknown angle measures in similar triangles and quadrilaterals.
Section B	**Learning Target #3** Determine that two triangles are similar and find missing measures.	**Lesson 4** • I can explain why the Angle-Angle Triangle Similarity Postulate works. • I can explain why the Side-Angle-Side and Side-Side-Side Triangle Similarity Theorems work. **Lesson 5** • I can determine whether two triangles are similar using triangle similarity theorems and postulates. • I can find missing measures of similar triangles. **Lesson 6** • I can use indirect measurement to solve for unknown parts in similar triangles. • I can apply triangle similarity to real-life situations to calculate distances or heights that cannot be measured directly.
Section C	**Learning Target #4** Determine that two or more triangles that share sides and angles are similar and find missing measures.	**Lesson 7** • I can apply the side-splitter theorem to solve for unknown lengths in triangles. • ***ACC Only:*** I can apply the angle bisector theorem to solve for unknown lengths in triangles. **Lesson 8 (iM Lesson 13)** • I can find similar triangles formed by the altitude drawn to the hypotenuse of a right triangle. • I can solve problems involving similar right triangles.
End of Unit Assessment		

Unit Title	
Unit 3 (iM U4): Right Triangle Trigonometry (~9 blocks)	
Relevant Standards: Bold indicates priority	
HSA-CED.A.4 HSG-CO.A.2 HSG-CO.C.10 HSG-MG.A.1 HSG-MG.A.3 HSG-SRT.B.5 HSG-SRT.C.6 HSG-SRT.C.7 HSG-SRT.C.8 HSN-Q.A.2 HSN-Q.A.3	
Essential Question(s)	**Enduring Understanding(s)**
• How can the ratio of two sides of a right triangle describe one of its acute angles? • Why do sine, cosine, and tangent depend only on the angle and not on the size of the triangle? • How can we find unknown sides and angles of a right triangle? • How do trigonometric ratios help us solve real-world problems involving height, distance, and slope?	• The trigonometric ratios of an acute angle depend only on that angle, because similar right triangles have equal side ratios. • The Pythagorean Theorem relates the three sides of any right triangle and is the basis for finding unknown lengths. • The sine of an acute angle equals the cosine of its complement, reflecting the complementary relationship of the two acute angles in a right triangle. • Inverse trigonometric functions find an unknown angle from two known sides, and angles of elevation and depression model real-world situations.
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	9 Blocks (80 minute lessons)

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Hypotenuse Leg Opposite side Adjacent side Pythagorean Theorem Pythagorean triple Simplest radical form (ACC) Special right triangles (ACC) Sine Cosine Tangent Inverse trigonometric function Angle of elevation Angle of depression	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• Physics: Forces on a ramp or inclined plane are split into components using sine and cosine. • Civil engineering and construction: Road grades and	• Mixing up opposite and adjacent sides by using the position of the right angle instead of the reference angle.

roof pitches are slopes described by tangent, and accessibility ramps must meet specified slope ratios.
- Aviation: Pilots use descent angles and glide slopes, which are angles of depression measured from a horizontal line.
- Video game design: Character movement and aiming use sine and cosine to find horizontal and vertical components of direction.
- Astronomy and surveying: Angles of elevation measure the height of a tower, a mountain, or a star above the horizon.

- Believing sin A = cos A, or that sine and cosine of the same angle are interchangeable.
- Assuming trig ratios change with triangle size.
- Applying the Pythagorean Theorem to a non-right triangle, or naming the wrong side as the hypotenuse.
- Simplifying radicals incorrectly, such as $\sqrt{(9 + 16)} = 3 + 4$ **(ACC)**.
- Confusing angle of elevation with angle of depression.

Connections to Prior Units

- Unit 2 (Similarity): similar right triangles and the altitude-to-hypotenuse relationships explain why trig ratios depend only on the angle.
- Unit 1: complementary angles and the triangle angle sum, which underlie the complementary-angle relationship between sine and cosine.
- Grade 8: the Pythagorean Theorem and its applications, needed to find missing sides.
- Prior coursework: simplifying square roots, used for special right triangles and radical expressions **(ACC)**.

Connections to Future Units

- Unit 4 (Solid Geometry): the Pythagorean Theorem and trig ratios find heights and slant heights of pyramids and cones.
- Unit 5 (Coordinate Geometry): the distance formula is a Pythagorean Theorem application, and slope is the tangent of the angle of inclination.
- Unit 6 (Circles): radian measure extends the trig ideas to the unit circle.
- Future courses (Algebra 2 and Precalculus): trig functions, the unit circle, and the Law of Sines and Law of Cosines for non-right triangles.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1A	"Exact Measurement Audit" comparing exact radical values vs. rounded decimal approximations in architectural design and construction blueprints.	Visual prime factor tree templates and step-by-step radical simplification flowcharts highlighting perfect square factors	Solve radical expression sets using a choice of handwritten factor trees, digital drag-and-drop tile applets, or screencast walkthroughs.
LT2	"Ramp & Ladder Safety Inspection" testing whether wheelchair ramps and ladders meet safety code slope ratios using exact right triangle side measurements.	Color-coded Pythagorean Theorem formula scaffolds mapping legs vs. hypotenuse alongside visual square-grid area models.	Calculate missing side lengths using handwritten algebraic steps, digital calculator logs, or physical grid-manipulative demonstrations.
LT3	"Shadow Ratio Mystery" measuring outdoor shadows of objects of different heights at the same time of day to discover constant side ratios across similar triangles.	Color-coded SOH CAH TOA reference cards mapping opposite, adjacent, and hypotenuse relative to a targeted reference angle.	Construct a digital applet proving side ratios stay constant across similar right triangles or write a comparative ratio breakdown.
LT4	"Virtual Drone Flight Planner" calculating the horizontal distance needed to reach a targeted altitude given a fixed ascent angle.	Visual decision flowchart mapping given information (reference angle + 1 known side) to the correct trig ratio.	Solve for unknown side lengths using step-by-step handwritten algebra, calculator syntax logs, or student-recorded video tutorials.
LT5	"Crime Scene / Impact Angle Investigation" determining the trajectory angle of an object using horizontal and vertical impact distances.	Calculator key guide paired with labeled right triangle diagrams showing the unknown angle.	Submit solved angle problems via written algebraic equations, interactive Desmos models, or oral explanations.
LT6	"Co-Function Discovery Lab" using interactive geometry applets to slide an angle measure and observe its sine value continuously equal the opposite angle's cosine.	Dual-labeled right triangle diagram displaying complementary angles with matching color-coded side ratios.	Write a Claim-Evidence-Reasoning (CER) explanation or record a short video proving why the sine of an angle is equal to the cosine of its complementary angle.
LT7	"Surveyor & Aviation Challenge" measuring real school building heights or pilot descent paths using homemade clinometers and elevation angles.	Annotated real-world diagrams contrasting angle of elevation (looking up from horizontal) vs. angle of depression (looking down from horizontal).	Design a real-world trigonometry word problem portfolio, present a clinometer height lab report, or record a video solving a scenario.

Supporting Multilingual/English Learners (*CELP standards*)			
	Emerging	**Expanding**	**Bridging**
LT1A	I can simplify basic square roots using a perfect square visual reference card and prime factor tree templates.	I can evaluate and simplify radical expressions using radical multiplication and division properties with guided calculation steps.	I can independently apply properties of radicals to evaluate, simplify, and rationalize complex radical expressions with full written work.
LT2	I can label the legs and hypotenuse on a right triangle and solve for missing sides using a color-coded Pythagorean Theorem formula card.	I can use the Pythagorean theorem to calculate missing side lengths of right triangles using step-by-step problem templates.	I can calculate exact missing side lengths of right triangles algebraically, simplifying radicals and justifying each step.
LT3	I can label the opposite, adjacent, and hypotenuse sides of a right triangle relative to a reference angle using SOH CAH TOA visual cards.	I can set up sine, cosine, and tangent ratios for similar right triangles using SOH CAH TOA reference frames and side ratio templates.	I can apply geometric similarity in right triangles to derive, explain, and apply the sine, cosine, and tangent ratios in written detail.
LT4	I can select the correct trig ratio (sin, cos, or tan) and plug given values into a visual equation guide to find a missing side.	I can set up and solve trigonometric equations to calculate missing side lengths of right triangles using structured calculation frames.	I can select, set up, and algebraically solve trigonometric equations to find any missing side length of a right triangle with full written justifications.
LT5	I can use an inverse trig button guide to find a missing angle measure from a given side ratio.	I can set up and solve inverse trigonometric equations to calculate missing acute angle measures using structured templates.	I can evaluate side relationships to apply inverse trigonometric functions to find missing acute angles of right triangles with full algebraic reasoning.
LT6	I can match the sine of one acute angle to the cosine of the other acute angle in a right triangle using a color-coded diagram.	I can explain why the sine of an angle equals the cosine of its complementary angle using sentence frames and labeled right triangle diagrams.	I can prove and explain in detail why the sine of an angle is equal to the cosine of its complementary angle using right triangle side relationships and complementary angle definitions.
LT7	I can label real-world pictures (angles of elevation/depression, height, distance) to create a right triangle diagram using visual prompts.	I can solve real-world word problems involving height and distance using right triangle trig templates and sentence starters.	I can model, analyze, and solve complex real-world application problems involving angles of elevation and depression, justifying each step in context.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1A** ***ACC Only*** Use the properties of radicals to evaluate and simplify radical expressions. **Learning Target #2** Find missing side lengths of right triangles.	**Lesson 1A (ACC only)** • I can multiply, add, and divide expressions with square roots. • I can simplify square roots by rewriting them as the product of a square root of a perfect square and another number. • I can rationalize a denominator that contains a single radical. • I can recognize whether an expression is in simplest radical form and simplify it if it is not. **Lesson 2** (ACC 1 Day, ACA 2 Days, if needed) • I can identify the hypotenuse and legs of a right triangle. • I can apply the Pythagorean Theorem to find missing measures of right triangles. • I can recognize that an irrational number expressed as a radical is the most precise and that a decimal representation is an approximation. **Lesson 3 (ACC Only)** • I can discover the special right triangle relationships using the Pythagorean Theorem. • I can use special right triangle relationships to find missing measures.

Section B	**Learning Target #3** Apply relationships among similar right triangles to discover and apply cosine, sine, and tangent ratios. **Learning Target #4** Use trigonometric ratios to find missing side lengths of right triangles. **Learning Target #5** Use inverses of trigonometric ratios to find missing angle measures of right triangles.	**Lesson 4** ● I can compare the ratios of corresponding sides of similar triangles (e.g., opposite/hypotenuse) to show they are proportional. ● I can explain that because all right triangles with a common acute angle are similar, the ratios of their side lengths (trigonometric ratios) are constant regardless of the triangle's size. ● I can define the sine, cosine, and tangent ratios. **Lesson 5 (iM Lesson 6)** ● I can write an equation using trig functions to relate an angle and the ratio of two sides. ● I can find the missing side lengths of a right triangle when given one side length and one of its acute angles. **Lesson 6 (iM Lesson 10)** ● I can find the acute angles of a right triangle when given two side lengths.
Section C	**Learning Target #6** I can explain why $\sin(\theta)=\cos(90-\theta)$ **Learning Target #7** Use trigonometric functions to solve real-world problems involving height, distance, and angles.	**Lesson 7 (iM Lesson 8)** ● I can explain why the sine of an angle equals the cosine of its complement using geometric reasoning. **Lesson 8 (iM Lesson 7+)** ● I can write trigonometric equations to represent real-world situations involving height, distance, and angles. ● I can find the angle of elevation or depression or use the angle of elevation/depression to calculate heights and distances.
End of Unit Assessment		

Unit Title

Unit 4 (iM U5): Solid Geometry

(ACA ~10 blocks in S1, include on midterm) (ACC ~ 5 blocks in S1, 5 blocks in S2, not on midterm, give quiz)

Relevant Standards: Bold indicates priority

HSA-CED.A.2	HSA-SSE.A.1.a	HSA-SSE.A.1.b	HSF-IF.C.9	HSG-CO.C.10
HSG-GMD.A.1	HSG-GMD.A.3	HSG-GMD.B.4	HSG-MG.A.1	HSG-MG.A.2
HSG-MG.A.3	HSG-SRT.C.8	HSN-Q.A.1		

Essential Question(s)	Enduring Understanding(s)
• How do we determine the surface area and volume of three-dimensional figures? • What do the volume formulas for prisms, pyramids, cylinders, cones, and spheres have in common? • How does scaling a figure's dimensions by a factor affect its area and volume? • How can volume and density describe real objects?	• Surface area measures the total area covering a solid, and volume measures the space inside it; they are measured in square and cubic units. • Many volume formulas share the structure base area times height, and pyramids and cones hold one-third of the volume of prisms and cylinders with the same base and height. • When dimensions are scaled by k, area scales by k^2 and volume scales by k^3. • Cavalieri's principle lets us find the volume of an oblique solid from its base area and perpendicular height, and density connects mass to volume.
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	ACA
	• 10 blocks in Semester 1 (80 minute lessons)
	
	ACC
	• 5 blocks (Semester 1) and 5 blocks (Semester 2)
	• Ten 80 minute lessons

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Polyhedron Prism Pyramid Cylinder Cone Sphere Net Lateral area Surface area Slant height Oblique solid Cavalieri's principle Density Volume scale factor	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• Packaging and manufacturing: Companies design containers to hold a required volume with the least surface area, which lowers material cost.	• Forgetting the one-third in pyramid and cone volume formulas, or the four-thirds in the sphere formula. • Using slant height where the perpendicular height is

• Construction and civil engineering: Concrete footings, silos, and cylindrical water tanks are estimated with volume formulas. • Biology: Surface-area-to-volume ratios shrink as organisms grow, which affects heat loss and nutrient exchange in cells and animals. • Earth and physical science: Density identifies materials such as metals or minerals and helps estimate the mass of a rock sample. • Culinary arts: Bakers adjust recipes when changing pan size, since the volume of a similar pan scales with the cube of the scale factor.	needed, or the reverse. • Thinking doubling every dimension doubles volume or area. • Confusing surface area with volume, or using square units for volume. • Using the slanted side length of an oblique prism as its height. • Forgetting to take a square or cube root when solving for a radius or side from area or volume.
Connections to Prior Units	**Connections to Future Units**
• Grade 7: area and circumference of circles, and area and volume of prisms and cylinders. • Grade 7: nets of three-dimensional objects and surface area. • Unit 2 (Similarity): the scale factor concept, which this unit extends to area (k^2) and volume (k^3). • Unit 3 (Trigonometry): the Pythagorean Theorem and trig ratios used to find slant heights and heights of pyramids and cones.	• Unit 5 (Coordinate Geometry): area and perimeter of polygons on the coordinate plane use the area formulas from Unit 4. • Unit 6 (Circles): the circle area formula from this unit extends to sector area and arc length, and to the circular bases of cylinders and cones. • Future courses (Calculus): volumes of solids of revolution and cross-sections extend Cavalieri's principle.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Floor Plan & Turf Cost Challenge" calculating material costs to tile irregular rooms or resurface multi-shape athletic fields.	Color-coded formula cheat sheet visually decomposing composite 2D shapes into basic rectangles, triangles, and circles.	Calculate total area using handwritten grid decompositions, interactive Desmos geometry tools, or a video walkthrough explaining shape partitioning.
LT2 A	"Packaging & Gift Wrap Audit" investigating how manufacturing companies minimize cardboard waste when designing product boxes.	Unfoldable 3D physical nets and interactive digital 3D applets that map folded solid faces directly to flat 2D shapes.	Compute surface area using physical net cutouts, labeled color-coded diagrams, or step-by-step video demonstrations.
LT3	"Water Capacity & Displacement Lab" filling cylindrical containers and cone cups to compare actual liquid volume against calculated capacity.	Master volume visual organizer grouping solids by structural family V = BH vs. V = ⅓BH vs. $V=4/3\pi r^2$	Solve volume problems using handwritten algebraic equations, digital spreadsheet calculators, or audio/video explanations of formula selection.
LT4	"Stack of Cards / Cavalieri's Principle Experiment" sliding a deck of cards horizontally to demonstrate why slanting a shape (oblique) preserves its total volume.	Color-coded 3D diagrams illustrating additive composite shapes (solid + solid) vs. subtractive composite shapes (solid - cutout).	Build and calculate complex volumes using 3D modeling software (e.g., Tinkercad), physical block assemblies, or structured multi-step calculation sheets.
LT5	"Container Redesign Challenge" working backward from a required liquid volume constraint (e.g., 500 mL) to determine ideal cylinder height and radius.	Step-by-step literal equation flowchart displaying inverse algebraic operations (cube roots, square roots, division by π to isolate target variables.	Calculate missing dimensions using written algebraic inverse steps, digital algebra solvers, or student-created instructional guides.
LT6	"Dollhouse & Giant Prop Analysis" investigating how surface area and volume scale dramatically when shrinking or enlarging 3D models.	Visual scale factor comparison matrix highlighting linear (k), surface area (k^2), and volume (k^3) growth relationships.	Solve scaling problems by filling out dimensional ratio tables, building interactive GeoGebra scaling models, or recording a screencast explanation.
LT7	"Gold Bar vs. Fake Metal Mystery" weighing mystery metal blocks and computing density to verify if an object is pure gold or brass.	Color-coded Density Triangle visual scaffold paired with unit conversion reference charts.	Solve real-world density problems via written multi-step calculations, a lab report summary of physical samples, or a video explanation of buoyancy/density.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can match common 2D shapes (rectangles, triangles, circles, trapezoids) to their area formulas and calculate area using visual equation guides.	I can calculate the areas of common 2D shapes using step-by-step formula templates and sentence frames.	I can select and apply area formulas to compute exact and rounded areas of common 2D shapes, providing complete written work.
LT2A	I can match 3D net diagrams of prisms and pyramids to their 2D faces and add face areas using visual templates.	I can calculate the surface area of polyhedra using 3D nets, surface area formulas, and step-by-step calculation frames.	I can independently compute the total and lateral surface areas of complex polyhedra using formulas or nets, explaining each calculation step.
LT3	I can match 3D solid shapes to their volume formulas and plug in given dimensions using visual formula reference cards.	I can calculate the volume of prisms, pyramids, cylinders, cones, and spheres using structured formula templates.	I can select and apply correct formulas to calculate exact and approximate volumes of various 3D solids, writing full algebraic steps.
LT4	I can break composite 3D shapes into simpler solids using color-coded diagrams and visual shape cards.	I can calculate the volume of composite and oblique solids by adding/subtracting component volumes using guided templates.	I can analyze and compute the volumes of composite, oblique, and non-rectangular base solids using Cavalieri's principle and multi-step formula integration.
LT5	I can identify the missing measurement (height, radius, or base area) on a 3D diagram and use a simplified formula card to find it.	I can solve for an unknown dimension (like height or radius) when given the total volume using step-by-step equation templates.	I can algebraically rearrange volume formulas to calculate unknown linear dimensions of 3D solids, justifying each algebraic step.
LT6	I can match scale factors to area changes and volume changes using visual comparison charts.	I can calculate how changing scale factor affects the area and volume of similar solids using ratio templates and sentence frames.	I can analyze and apply scale factor relationships to compute areas, volumes, or scale factors of dilated 2D and 3D figures with complete written work.
LT7	I can calculate density using a D = m/V formula triangle card and match units to visual labels.	I can solve word problems involving density, mass, and volume using structured calculation frames and sentence starters.	I can apply the density formula) to solve multi-step real-world problems involving mass, volume, and material composition, explaining conclusions in context.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1** Find areas of common shapes. **Learning Target #2A** ***ACC Only*** Find the surface areas of polyhedra (triangular and rectangular prisms, square pyramids). **Learning Target #3** Find the volumes of triangular and rectangular prisms, square pyramids, cylinders, cones, and spheres. **Learning Target #4** Find the volumes of more complex solids, including composite solids, oblique solids, and pyramids, cones, and prisms with non-rectangular bases. **Learning Target #5** Use volume formulas to calculate unknown measurements when given a volume.	**Lesson 1** • I can use formulas to find the areas of circles, parallelograms, and triangles. • I can find the area of a triangle using the Pythagorean Theorem to find the altitude of the triangle. • **ACC Only**: I can use trigonometry to find the areas of triangles and parallelograms given angles and side lengths. • **ACC Only:** I can find the surface areas of polyhedra whose faces are triangles, rectangles, and parallelograms. **Lesson 2** • I can recognize and name rectangular prisms, rectangular pyramids, cones, spheres, and cylinders. • I can use the formulas for the volumes of rectangular prisms, rectangular pyramids, cones, spheres, and cylinders. • I can find the volumes of composite solids. **Lesson 3** • I can work backwards with a volume formula to calculate an unknown measurement.

		• I can use the Pythagorean Theorem to solve for an unknown measurement to find the volume of a pyramid or cone. **Lesson 4** • I can calculate the volume of a generalized prism (V = Bh) or pyramid (V = ⅓Bh) given information about its base and its height. • I can calculate the volume of an oblique prism, cylinder, or pyramid using Cavalieri's principle. • I can explain why an oblique solid has the same volume as a non-oblique solid with the same length, width, and height.
Section B	**Learning Target #6** Understand the relationships between areas and volumes of dilated figures and scale factors and use that to calculate areas, volumes, and scale factors. **Learning Target #7** Solve problems involving density, mass, and volume.	**Lesson 5** • I can calculate the area of a new 2-dimensional figure after it has been dilated • I can explain that if a two-dimensional shape is dilated by a scale factor of k, its area is multiplied by k^2. • I can work backwards from an area scaling to find a scale factor. **Lesson 6** • I can calculate the volume of a new 3-dimensional figure after it has been dilated • I can explain that if a three-dimensional shape is dilated by a scale factor of k, its volume is multiplied by k^3. • I can work backwards from a volume scaling to find a scale factor. • **ACC Only:** I can calculate the surface area of a scaled figure. **Lesson 7** • I can calculate the density of an object given its mass and volume or dimensions. • I can calculate the mass or volume of an object given its density.
End of Unit Assessment		

Unit Title				
Unit 5 (iM U6): Coordinate Geometry (~9 blocks)				
Relevant Standards: Bold indicates priority				
HSA-CED.A.2	HSA-CED.A.4	HSA-REI.C.7	HSA-SSE.A.1.a	HSA-SSE.A.2
HSA-SSE.B.3	HSF-IF.C.7	HSF-IF.C.7.b	HSG-C.A.2	HSG-CO.A.1
HSG-CO.A.5	HSG-CO.C.9	HSG-CO.C.10	HSG-GMD.A.1	HSG-GPE.A.1
HSG-GPE.B.4	HSG-GPE.B.5	HSG-GPE.B.6	HSG-GPE.B.7	

Essential Question(s)	Enduring Understanding(s)
• How can algebra describe geometric figures on the coordinate plane? • What does slope tell us about the relationship between two lines? • How can coordinates be used to prove geometric properties and to calculate distance, midpoint, and area? • How can the equations of circles and lines tell us where they intersect?	• Coordinates connect algebra and geometry: distance, midpoint, and slope are geometric measures calculated from coordinates. • Slope describes the steepness and direction of a line and determines whether lines are parallel or perpendicular. • A circle can be described algebraically by its center and radius, which lets us solve problems about where circles and lines meet. • Coordinate methods can prove geometric claims, and the number of solutions to a system shows how a line and a circle intersect.
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	9 Blocks (80 minute lessons)

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Coordinate plane Slope Rise and run Point-slope form Parallel lines Perpendicular lines Midpoint formula Distance formula Equation of a circle Center and radius System of equations	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• GPS and mapping: Coordinates locate places on a map, and the distance formula estimates the straight-line distance between two locations. • Economics and business: Slope is a rate of change, such as the cost per mile for a rideshare or the price per pound at a store.	• Reversing rise and run, or mixing the order of x- and y-differences in slope. • Believing perpendicular lines have the same slope, or the same negative slope. • Forgetting the square root in the distance formula, or dropping a negative sign on a coordinate.

• Physics: On a position-time graph, slope is velocity, and the distance formula gives displacement in two dimensions. • Telecommunications and emergency services: A cell tower's coverage area is a circle, and overlapping circles help locate a phone. • Computer graphics and game design: Shapes are defined by coordinates, midpoints locate centers, and distance checks detect collisions.	• Averaging only one coordinate, or mixing x-values and y-values in the midpoint formula. • Writing a circle equation with the wrong sign on the center, or using r instead of r^2. • Assuming a line and a circle always intersect at two points.
Connections to Prior Units	**Connections to Future Units**
• Grade 8: slope and linear equations and graphs of linear relationships. • Grade 8: the Pythagorean Theorem, which the distance formula is built on. • Unit 1, Lesson 6: midpoints and perpendicular bisectors, now expressed with coordinates. • Unit 4 (Solid Geometry): area formulas, used for polygons on the coordinate plane in Lessons 4-6.	• Unit 6 (Circles): circle equations and tangent lines rely on the radius being perpendicular to the tangent, which uses the perpendicular slopes from this unit. • Unit 6 (Circles), Lesson 5 (ACC): finding the center of a circumscribed circle uses perpendicular bisectors on the coordinate plane. • Future courses (Algebra 2 and Precalculus): conic sections and systems of nonlinear equations extend the circle and line work. • Unit 8 (One Variable Statistics): limited direct link; coordinate-plane reasoning supports later work with scatter plots and linear models.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Ramp Steepness & Rate of Change Audit" evaluating skateboard ramps, roof pitches, or hill gradients to connect physical steepness to positive, negative, zero, or undefined slope values.	Color-coded rise-over-run visual scaffolds mapping graph stair-steps directly to ordered pair coordinates and slope-intercept equations.	Calculate slope using a choice of digital Desmos slope sliders, physical rise/run counting grids, or handwritten algebraic slope formulas.
LT2	"Rideshare Rate Comparison" comparing price-per-mile rates across different linear graphs, tables, and equations to identify which service has the steeper slope.	Multi-modal comparative matrix displaying the same line across four distinct formats: a coordinate graph grid, an (x, y) table, ordered pairs, and a solved equation.	Identify and compare slopes across varying formats by completing interactive matching cards, recording audio justifications, or solving written practice sets.
LT3	"GPS Route Tracker" fixing a known reference point on a coordinate map and tracking motion using a constant heading or slope direction.	Color-coded visual template for point-slope form with highlighted slots for the given point coordinates and slope.	Construct point-slope equations using drag-and-drop digital equation builders, handwritten substitution templates, or student-recorded screencasts.
LT4	"Architectural Grid Alignment Challenge" testing whether structural beams on a coordinate blueprint are parallel (equal slopes) or perpendicular (opposite reciprocal slopes).	Visual decision flowchart guiding algebraic rearrangement of standard form Ax + By = C to y = mx + b alongside visual slope comparison rules.	Sort equation pairs into parallel, perpendicular, or intersecting categories using physical sorting cards, Desmos graphing checks, or written algebraic proofs.
LT5	"Robotic Path Navigation" programming a drone flight path to move parallel or perpendicular to an existing boundary line through a specific waypoint coordinate.	Scaffolded step-by-step graphic organizer isolating the target slope (same or opposite reciprocal) and plugging it into a point-slope form scaffold.	Deliver line equations through handwritten multi-step algebraic work, interactive digital geometry software, or peer-led whiteboard demonstrations.
LT6	"Emergency Response Logistics" locating the exact geographic midpoint between two hospitals or calculating straight-line flight distances between emergency calls.	Dual-view reference card linking the distance formula directly to the Pythagorean Theorem alongside a visual coordinate-averaging model for midpoints.	Calculate distances and midpoints using physical grid tracing, step-by-step formula worksheets, or audio explanations of missing endpoint logic.
LT7	"5G Tower Coverage Audit" testing whether specific neighborhood coordinates fall inside, outside, or	Color-coded circle equation scaffold mapping center coordinates and radius directly to a graph visualization.	Write circle equations and test coordinate points via written algebraic substitution, digital GeoGebra circle

	directly on the circular perimeter of a cell tower zone.		tools, or video tutorial explanations.
LT8	"Radar Target Identification" decoding standard-form radar equations to locate storm centers and plot weather radii on a digital navigation grid.	Annotated sign-flip guide emphasizing why $(x - h)^2$ yields a h center coordinate, paired with visual step-by-step graphing directions.	Graph circles and extract features using handheld compasses on graph paper, interactive graphing apps (Desmos), or student-led visual presentations.
LT9A	"Property Land Survey Mystery" evaluating boundary coordinate plots to classify real estate parcels and compute total taxable land area.	Quadrilateral classification flowchart matching required coordinate checks (distance formula for side/diagonal lengths, slope formula for parallel/perpendicular sides).	Construct coordinate proofs and area calculations using structured multi-step proof templates, digital whiteboard walkthroughs, or formal written arguments.
LT10	"Asteroid Trajectory & Defense Tracking" modeling linear flight paths intersecting circular planetary defense shields to find exact collision points.	Multi-representation visual chart showing 0, 1 (tangent), or 2 intersection points graphically alongside algebraic substitution scaffolds.	Solve systems using algebraic substitution, digital Desmos intersection checks, or student-recorded video tutorials.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can find the slope (rise over run) from a graph or two points using visual templates and a slope formula card.	I can calculate the slope of a line from graphs, ordered pairs, and linear equations using step-by-step calculation frames.	I can determine and explain the slope of a line represented as a graph, pair of coordinates, or linear equation.
LT2	I can identify positive, negative, zero, or undefined slopes from graphs and equations using a visual reference guide.	I can find and compare slopes from graphs, ordered pairs, and equations using structured calculation templates.	I can evaluate and calculate the slope of a line from any given representation (graph, ordered pairs, or equation) with algebraic precision.
LT3	I can match a point and slope to their places in a point-slope formula template.	I can write and interpret the equation of a line in point-slope form using given points and slopes with sentence frames.	I can write, interpret, and convert equations of lines in point-slope form, explaining what the point and slope represent in context.
LT4	I can sort pairs of lines into parallel (same slope), perpendicular (opposite reciprocal), or neither using a visual checklist.	I can find slope from standard form ($Ax + By = C$) and determine if lines are parallel, perpendicular, or neither using structured templates.	I can convert standard-form equations to identify slopes and algebraically justify whether two lines are parallel, perpendicular, or neither.
LT5	I can write a new line equation using a target slope card and point-slope template with step-by-step visual prompts.	I can write the equation of a line parallel or perpendicular to a given line through a specific point using guided equation frames.	I can construct the equation of a line parallel or perpendicular to a given line through any given point, justifying my algebraic steps.
LT6	I can calculate distance and find midpoints on a grid using color-coded formula cards for distance and midpoint.	I can use the midpoint and distance formulas to calculate segment lengths, midpoints, and missing endpoints using step-by-step frames.	I can apply the distance and midpoint formulas algebraically to solve complex coordinate problems, including finding missing endpoints.
LT7	I can plug center and radius into a color-coded circle formula card.	I can write a circle's equation from its center and radius, and check if a point lies on it using a guided checklist.	I can write the equation of a circle given its center and radius, and algebraically test whether specific coordinate points lie on, inside, or outside the circle.
LT8	I can identify the center and radius from a circle equation and plot it on a grid using a visual step guide.	I can determine the center and radius from a circle equation and graph the circle using a coordinate template.	I can extract the center and radius from any standard-form circle equation and accurately graph the circle on the coordinate plane.
LT9A	I can calculate perimeter by counting grid units or using a distance formula template, and match shapes to property cards.	I can calculate area and perimeter from vertex coordinates and complete guided proofs to classify quadrilaterals using graphic organizers.	I can use coordinate geometry (distance, slope, midpoint) to calculate area and perimeter and write formal proofs classifying specific quadrilaterals.
LT10	I can identify intersection points of a line and a circle on a graph using visual markers and solution templates.	I can solve a system with a line and a circle graphically or algebraically using step-by-step substitution templates.	I can algebraically solve systems of equations involving a circle and a line, finding all intersection points and interpreting the solutions.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1** Determine the slope of a line from graphs, ordered pairs, and linear equations. **Learning Target #2** Determine the slope of a line from graphs, ordered pairs, and linear equations. **Learning Target #3** Write and interpret the equation of a line in point-slope form. **Learning Target #4** Find the slope of a line from an equation in standard form, and determine whether two lines are parallel, perpendicular, or neither. **Learning Target #5** Write the equation of a line that is parallel or perpendicular to a given line and passes through a given point. **Learning Target #6** Find the midpoint of a segment, find a missing endpoint from one endpoint and the midpoint, and calculate the distance between two points.	**Lesson 1 (iM Lesson 9)** • I can find the slope of the line segment between two points on a coordinate plane. • I can find the slope of the line segment between two points when given their coordinates. • I can write or interpret the equation of a line in point-slope form. **Lesson 2 (iM Lesson 10, 11, & 12)** • I can find the slope of a line from an equation in standard form. • I can determine whether two equations represent lines that are parallel, perpendicular, or neither. • Given the equation of a line and the coordinates of a point, I can write the equation of a line that is parallel or perpendicular to the given line and which passes through the given point. **Lesson 3 (iM Lesson 15)** • I can find the midpoint of a segment using the midpoint formula • I can find endpoint coordinates when given one endpoint and the midpoint • I can calculate the distance between two points on a graph or from their coordinates.
Section B	**Learning Target #7** Determine whether a point lies on a circle, and write the equation of a circle from its center and radius. **Learning Target #8** Find the center and radius of a circle from its equation, and graph a circle from its standard-form equation. **Learning Target #9A** ***ACC Only*** Find the area and perimeter of triangles and quadrilaterals from their vertex coordinates, and prove whether a quadrilateral is a square, rectangle, rhombus, parallelogram, or trapezoid **Learning Target #10** Solve a system of equations involving a circle and a line.	**Lesson 4 (iM Lesson 4)** • I can determine whether a point is on a circle with a given radius and center. • I can write the equation of a circle with a given radius and center • I can determine the radius and center of a circle when given its equation. **Lesson 5 (ACC Only) (iM Lesson 14 & 18)** • I can find the area and perimeter of quadrilaterals and triangles when given the coordinates of their vertices. • I can determine whether a shape is a square, rectangle, rhombus, parallelogram, or trapezoid, and if so, prove it. **Lesson 6 (iM Lesson 13)** • I can graph an equation of a circle given its equation in standard form. • I can find the solution to a system of equations involving a circle and a line. (Desmos can be introduced)
End of Unit Assessment		

Unit Title	
Unit 6 (iM U7): Circles (~8 blocks)	
Relevant Standards: Bold indicates priority	
HSA-SSE.A.1 HSA-SSE.A.1.b HSG-C.A.2 HSG-C.A.3 HSG-C.B.5 HSG-CO.A.2 HSG-MG.A.1 HSG-GPE.A.1 HSG-MG.A.3 HSG-SRT.C.8 HSG-SRT.B.5	
Essential Question(s)	**Enduring Understanding(s)**
• What relationships exist among angles, arcs, chords, and tangent lines in a circle? • How does the radius of a circle determine its arc lengths and sector areas? • How does the geometry of circles describe real objects such as wheels, gears, and arches? • What makes a point equidistant from the vertices or from the sides of a triangle?	• Angles in a circle are determined by the arcs they intercept: a central angle equals its arc, and an inscribed angle equals half its arc. • A tangent line is perpendicular to the radius at the point of tangency, connecting circle geometry to perpendicular relationships. • Arc length and sector area are fractions of the circumference and area of the whole circle, determined by the central angle. • The circumcenter and incenter are points of concurrency defined by perpendicular bisectors and angle bisectors, and they are equidistant from the vertices or the sides, respectively **(ACC).**
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	8 Blocks (80 minute lessons)

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Circle Chord Diameter Arc Central angle Inscribed angle Inscribed polygon Tangent line Secant Circumscribed circle Circumcenter (ACC) Incenter (ACC) Arc length Sector Segment of a circle Annulus	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• Engineering and mechanics: Gears, pulleys, and	• Thinking an inscribed angle equals its intercepted arc

bicycle wheels link rotations through arc length; a larger wheel travels farther per turn. • Architecture: Rotundas, arches, and rose windows use central and inscribed angles to create symmetric circular layouts. • Physics: Circular motion is often measured in radians, where arc length equals radius times angle, which previews radian measure. • Data visualization and food: Pie charts and pizza slices show sector area as a fraction of the whole circle. • Navigation and astronomy: Distances along Earth's surface are arc lengths on a great circle, computed with Earth's radius.	rather than half of it. • Confusing arc measure (degrees) with arc length (linear units), or skipping the fraction of the circle. • Believing any line that touches a circle is tangent, or that the radius need not be perpendicular to the tangent. • Thinking opposite angles of an inscribed quadrilateral are equal rather than supplementary. • Confusing the circumcenter (perpendicular bisectors) with the incenter (angle bisectors) **(ACC)**. • Computing segment area with the wrong triangle, or using the diameter where the radius is needed.
Connections to Prior Units	**Connections to Future Units**
• Unit 1: triangle and polygon angle sums and perpendicular bisectors, used for inscribed polygons and circumcenters. • Unit 2 (Similarity): scale factors on radii, which explain why arc length and sector area scale with the radius. • Unit 4 (Solid Geometry): the area of a circle, from the circular bases of cylinders and cones. • Unit 5 (Coordinate Geometry): circle equations (Lessons 4-6) and perpendicular slopes for tangent lines.	• Unit 7 (Conditional Probability): Venn diagrams are often drawn with circles, so region-based reasoning carries over. • Unit 8 (One Variable Statistics): pie charts depend on sector reasoning; a limited but useful link for data displays. • Future courses (Algebra 2 and Precalculus): radian measure, the unit circle, and conic sections extend this unit.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Ferris Wheel & Target Audit" analyzing physical circular structures (wheel spokes, outer rims, pie cuts) to connect real-world objects to geometric terms.	Color-coded visual diagram key displaying circle parts with symbol decoder cards.	Label circle features using interactive digital drag-and-drop matching cards, physical string-and-peg circle boards, or a video walkthrough.
LT2	"Theater Sightlines Investigation" analyzing why seats along the same circular row subtend the exact same stage angle (inscribed angle theorem).	Dynamic GeoGebra visual applet showing inscribed angles alongside color-coded formula guides.	Solve angle/arc puzzles using written algebraic steps, audio/video recordings explaining the 2:1 relationship, or digital whiteboard demonstrations.
LT3	"Codebreaker Circle Challenge" solving interconnected algebraic expressions around a circular lock dial to reveal mystery combination codes.	Color-coded equation template mapping linear expressions directly to their corresponding geometric circle relationships.	Demonstrate solutions using step-by-step written algebra sheets, interactive Desmos solvers, or peer explanation recorded on video.
LT4A	"Geometry Detective Case" investigating why inscribed angles subtending a diameter always form a right triangle (Thales's Theorem).	Scaffolded flowchart proof templates visualizing the logical connection from isosceles radius triangles to the final inscribed angle proof.	Complete two-column proofs using physical statement/reason cards, digital flowchart builders, or handwritten formal proofs.
LT5	"Satellite Orbit & Horizon Test" modeling signal transmission lines tangent to Earth's circular surface to find distance to the horizon.	Labeled right triangle diagram visual highlighting the mandatory right angle formed where a tangent line meets a radius at the point of tangency.	Calculate missing side lengths or angles using the Pythagorean Theorem, digital software constructions, or narrated video walkthroughs.
LT6	"Cyclic Quadrilateral Architectural Design" analyzing stained glass rose windows to uncover why opposite corners always sum to 180°	Color-coded opposite angle pairing scaffolds paired with highlighted intercepted arc overlays.	Solve for missing angles using written linear equations, interactive geometry applets, or oral justifications in a small group.
LT7A	"Cell Tower / Search & Rescue Location Challenge" finding the exact equidistant point (circumcenter) to build a station serving three cities.	Step-by-step visual compass-and-straightedge construction guide detailing perpendicular bisector intersection (circumcenter) and angle bisector properties.	Construct circumscribed circles using physical compass/straightedge paper folds, GeoGebra digital tools, or a narrated screencast construction guide.

LT8	"Pizza Crust & Sprinkler Coverage Audit" calculating crust length vs. slice area, or lawn area watered by a rotating sprinkler head.	Visual fraction-of-circle reference cards mapping central angle ratios directly to circumference and area formulas.	Compute arc lengths and sector/segment areas using structured formula calculation sheets, spreadsheet tools, or student-created video tutorials.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can match circle parts (chords, arcs, central angles, radii, secants) to their correct symbols and names using visual reference cards and color-coded diagrams.	I can name and label chords, arcs, central angles, and circle segments using proper notation and sentence frames.	I can fluently identify, label, and distinguish all circle components using formal geometric notation in complex multi-step diagrams.
LT2	I can identify central and inscribed angles on a circle diagram and match them to visual formula cards.	I can calculate central and inscribed angle and arc measures using guided calculation frames and sentence starters.	I can analyze relationships between central and inscribed angles to determine missing angle and arc measures with full mathematical justifications.
LT3	I can set up simple algebraic equations for circle angles and arcs using color-coded diagram templates and formula cards.	I can solve multi-step algebraic equations to find unknown circle angle and arc measures using step-by-step calculation frames.	I can write, solve, and verify complex algebraic equations representing intersecting circle lines, angles, and arcs, explaining each step in writing.
LT4A	I can arrange cut-out proof steps in order to demonstrate an angle or arc relationship in a circle using visual clues.	I can complete missing statements and reasons in two-column circle proofs using a given reason bank and sentence starters.	I can independently construct formal geometric proofs (two-column or paragraph) to prove angle, arc, chord, and secant relationships in circles.
LT5	I can label right angles where a tangent line touches a radius using visual cards and solve for missing sides using Pythagorean Theorem templates.	I can calculate missing angles and side lengths created by tangent lines and radii using Pythagorean theorem templates and sentence frames.	I can apply tangent line properties (perpendicularity to radii, tangent segments from external points) to solve complex multi-step geometric problems with complete justifications.
LT6	I can identify opposite angles of a cyclic quadrilateral using color-coding and set them equal to 180° with a formula card.	I can set up and solve equations to find missing angles of inscribed quadrilaterals using supplementary angle rules and sentence starters.	I can explain why opposite angles of inscribed quadrilaterals are supplementary and calculate all unknown angles algebraically with written explanations.
LT7A	I can follow step-by-step visual picture cards to construct a circumscribed circle using a compass and straightedge.	I can construct a circumscribed circle and describe why perpendicular bisectors intersect at the circumcenter using sentence frames and guided templates.	I can execute geometric constructions with precision and write formal logical arguments explaining concurrency of perpendicular bisectors and the angle bisector theorem.
LT8	I can match geometric figures (sectors, segments, annuli) to their color-coded area/length formula cards and plug in given numbers.	I can calculate arc lengths, sector areas, segment areas, and annulus areas using step-by-step formula templates and sentence starters.	I can compute exact and rounded arc lengths, sector areas, segment areas, and annulus areas in complex composite figures, showing all algebraic steps.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1** Name chords, arcs, central angles, and segments of circles using correct notation. **Learning Target #2** Calculate central and inscribed angle measures and arc measures using the relationship between central and inscribed angles. **Learning Target #3**	**Lesson 1 (iM Lesson 1)** • I know what chords, arcs, and central angles are. • I can use correct notation to name segments, arcs, and angles related to circles. **Lesson 2 (iM Lesson 2)** • I can use the relationship between central and inscribed angles to calculate angle measures. • **ACC** I can prove angle and arc relationships in a circle. • I can use algebraic expressions along with angle and arc relationships to determine missing measures.

	Solve for unknown angle and arc measures when they are written as algebraic expressions. **Learning Target #4A** ***ACC Only*** Prove angle and arc relationships in a circle**.** **Learning Target #5** Use the relationship between tangent lines and radii to calculate angle measures and side lengths.	**Lesson 3 (iM Lesson 3)** ● I can use the relationship between tangent lines and radii to calculate angle measures. ● I can use the relationship between tangent lines and radii to calculate side lengths.
Section B	**Learning Target #6** Calculate missing angle measures of a quadrilateral inscribed in a circle using opposite angles and intercepted arcs. **Learning Target #7A** ***ACC Only*** Construct the circumscribed circle of a triangle, and explain why the perpendicular bisectors of its sides meet at one point and why any point on an angle bisector is equidistant from the rays that form the angle. **Learning Target #8** Calculate arc lengths, sector areas, segment areas, and annulus areas.	**Lesson 4 (iM Lesson 4)** ● I can use the relationship between opposite angles in a quadrilateral inscribed in circles to find missing angle measures. ● I can use arc measures and inscribed angles to calculate missing angle measures of an inscribed quadrilateral. **ACC Lesson 5 (iM Lesson 5 & 6)** ● I can construct the circumscribed circle of a triangle. ● I can explain why the perpendicular bisectors of a triangle's sides meet at a single point. ● I can explain why the angle bisectors of a triangle meet at a single point. ● I know any point on an angle bisector is equidistant from the rays that form the angle. **Lesson 6 (iM Lesson 8)** ● I can calculate lengths of arcs and areas of sectors in circles. ● I can calculate the area of a segment of a circle. ● I can calculate the area of the annulus of a circle.
End of Unit Assessment		

Unit Title	
Unit 7 (iM U8): Conditional Probability (~6 Blocks)	
Relevant Standards: Bold indicates priority	
HSS-CP.A.1 HSS-CP.A.2 HSS-CP.A.3 HSS-CP.A.4 HSS-CP.A.5 HSS-CP.B.6 HSS-CP.B.7 HSS-ID.B.5	
Essential Question(s)	**Enduring Understanding(s)**
• How does knowing that one event has occurred change the probability of another event? • How do we decide whether two events are independent? • How can two-way tables and Venn diagrams help us organize outcomes and calculate probabilities of combined events? • Why does it matter which group or condition a probability is measured within?	• Information about one event can change the probability of another, which is what conditional probability measures. • Two events are independent when P(A and B) = P(A) × P(B), and mutually exclusive events cannot both occur. • Two-way tables and Venn diagrams organize outcomes so that probabilities of "and," "or," and conditional events can be calculated. • Confusing which group a conditional probability refers to leads to incorrect conclusions in medicine, law, and everyday decisions.
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	6 Blocks (80 minute lessons)

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Sample space Event Two-way table Venn diagram Complement Union (or) Intersection (and) Addition Rule Mutually exclusive events Independent events Dependent events Conditional probability	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• Medicine: Screening tests produce false positives, so the chance that a positive result means disease depends on how common the disease is. • Law and justice: The prosecutor's fallacy confuses P(evidence given innocence) with P(innocence given evidence); discussing it builds conditional reasoning. • Sports analytics: Teams estimate win probability conditioned on the game state, such as the score or	• Confusing mutually exclusive events with independent events. • Reversing the condition, treating P(A | B) as equal to P(B | A). • Forgetting to subtract P(A and B) in the Addition Rule. • Assuming draws are independent when sampling without replacement. • Using the grand total instead of the row or column

the time remaining. • Genetics: Punnett squares model inheritance, and for independent genes the probabilities of combined traits multiply. • Weather and insurance: Forecasters and insurers estimate the probability of an event given observable conditions, such as cloud cover or risk factors.	total when reading a two-way table. • Listing outcomes incorrectly, such as treating HT and TH as the same outcome for two coins.
Connections to Prior Units	**Connections to Future Units**
• Grade 7: probability of simple and compound events, sample spaces, and relative frequency. • Grade 7: organized lists and tree diagrams for counting outcomes. • Grades 6-7: ratio and fraction reasoning, used to read part-to-whole relationships in two-way tables.	• Unit 8 (One Variable Statistics): relative frequency and comparing distributions across groups extend the two-way table reasoning from this unit. • Future courses (Statistics and Algebra 2): testing independence, binomial distributions, and Bayes' theorem build on conditional probability. • Course close: this unit completes the course's work on probability of combined events; no later unit in this course depends on it.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"School Survey Data Audit" analyzing real student survey data (e.g., favorite sports vs. grade level) to make data-driven predictions about school preferences.	Color-coded two-way table templates with highlighted row/column totals and ratio fraction scaffolds ($\frac{\text{cell total}}{\text{grand total}}$).	Calculate relative frequencies and estimated probabilities using a choice of digital spreadsheet tools, printed table cards, or a video walkthrough.
LT2	"Social Media App Preference Challenge" sorting student habits (e.g., uses TikTok, uses Instagram, both, or neither) into overlapping circles.	Dual-display visual templates mapping two-way table cells directly to corresponding regions of a Venn diagram.	Construct sample space diagrams and calculate event probabilities using drag-and-drop digital Venn diagram tools, physical sorting chips, or written probability statements.
LT3	“Game Show Prize Wheel" analyzing multi-stage game choices (e.g., spinning two wheels or picking doors) to calculate win odds.	Multi-modal graphic organizers displaying sample spaces via branch-by-branch tree diagrams, grid tables, and systematic ordered lists.	Map sample spaces and evaluate probabilities using interactive tree-diagram software, physical decision-branching cards, or handwritten systematic lists.
LT4	"Casino & Raffle Simulator" testing card drawing or marble pulling scenarios to analyze how keeping or returning items changes winning chances.	Physical/digital manipulative simulations paired with visual probability branch guides contrasting "with replacement" (constant totals) vs. "without replacement" (shrinking totals).	Model chance scenarios and submit calculated probabilities via digital probability simulators (Desmos/Excel), physical card/dice lab reports, or student-led video demonstrations.
LT5	"Overlapping Ticket Raffle Mystery" determining the odds of winning a prize if you hold tickets that fit multiple winning criteria (e.g., red tickets OR even-numbered tickets).	Color-coded Addition Rule formula card paired with a visual grid showing why double-counted overlap must be subtracted.	Compute compound event probabilities using structured algebraic calculation templates, interactive Desmos models, or verbal explanations of the overlap correction.
LT6	"Weather & Sports Win Investigation" analyzing real sports data to test if winning games is independent of playing in rain vs. clear weather.	Visual decision tree flowchart contrasting Independent Events vs. Dependent Events.	Classify event pairs as independent or dependent and calculate their probabilities using written calculation sheets, digital tree diagrams, or audio/video presentations.
LT7	"Medical Test Accuracy & Prosecutor's Fallacy Case" evaluating how a positive medical test result changes the actual probability of having a rare condition.	Restricted-row/column two-way table scaffolds highlighting the "given" condition sub-population as the new reduced denominator.	Solve conditional probability problems using written formula steps, interactive two-way table highlight apps, or peer-taught instructional screencasts.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging

LT1	I can point to numbers in a two-way table and fill in a fraction template with visual supports to estimate probability.	I can calculate relative frequencies from a two-way table and estimate probabilities using structured calculation steps and sentence frames.	I can calculate and interpret relative frequencies from two-way tables to estimate experimental probabilities and justify conclusions in writing.
LT2	I can sort visual data cards into a Venn diagram or two-way table to identify outcomes and find simple probabilities using color guides.	I can represent sample spaces using two-way tables and Venn diagrams to calculate probabilities of events using sentence starters.	I can construct two-way tables and Venn diagrams to represent complex sample spaces and analyze event probabilities with full written explanations.
LT3	I can complete a tree diagram or list of outcomes using visual templates to count total outcomes and calculate simple probabilities.	I can organize sample spaces using tree diagrams, lists, or tables to calculate probabilities of chance experiments using sentence frames.	I can systematically generate complete sample spaces using multiple representations (tree diagrams, tables, lists) to calculate and prove exact probabilities.
LT4	I can use picture cards and physical objects (dice, cards, colored blocks) to model drawing with or without replacement using visual guides.	I can model real-world chance experiments (with and without replacement) and calculate probabilities using structured problem templates.	I can evaluate and model complex real-world chance scenarios (with and without replacement) and mathematically explain how replacement alters outcomes.
LT5	I can plug given probabilities into a color-coded formula card for compound events.	I can apply the Addition Rule to calculate compound event probabilities using guided calculation templates and sentence frames.	I can explain and apply the Addition Rule to calculate probabilities of overlapping and mutually exclusive events.
LT6	I can identify if two events are independent or dependent using visual scenario cards and multiply given fractions with formula templates.	I can distinguish between independent and dependent events and calculate their probabilities using multiplication rule templates and sentence starters.	I can analyze, differentiate, and calculate probabilities for independent and dependent events, mathematically justifying why dependency alters probability.
LT7	I can highlight the restricted row or column on a two-way table for a "given that" statement using visual highlight overlays.	I can calculate conditional probabilities from two-way tables or formulas using step-by-step frames and sentence starters.	I can calculate, interpret, and explain conditional probabilities in real-world contexts with full written justifications.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A	**Learning Target #1** Use information in a two-way table to find relative frequencies and to estimate probability. **Learning Target #2** Use two-way tables and Venn diagrams to represent the sample space and find probabilities of events. **Learning Target #3** Find the sample space for a chance experiment, and organize outcomes using lists, tables, or tree diagrams to calculate probabilities. **Learning Target #4** Model real-world chance situations, such as dice, cards, and drawing with and without replacement, using probability.	**Lesson 1 (iM Lesson 4 & 5)** • I can use information in a two-way table to find relative frequencies and to estimate probability. • I can use tables and Venn diagrams to represent sample space and to find probabilities. • NOTE: Lesson 5 needs to be redesigned with more emphasis on finding probability from Venn diagrams. **Lesson 2 (iM Lesson 2 & 3)** • I can find the sample space for chance experiments. • I can use sample space to calculate probability. • I can model situations using probability. • I can create organized lists, tables, or tree diagrams and use them to calculate probabilities.
Section B	**Learning Target #5** Calculate the probability of a compound event using the Addition Rule.	**Lesson 3 (iM Lesson 6)** • I can use the addition rule to find probabilities. **Lesson 4 (iM Lesson 7 & 8)** • **ACC** I can calculate probabilities for dependent

	Learning Target #6 Calculate probabilities for dependent and independent events. **Learning Target #7** Calculate conditional probabilities, such as the probability of one event given that another has occurred.	and independent events. ● I can calculate conditional probabilities. ● NOTE: lesson 7 warm up and practice problems, de-emphasize notation
End of Unit Assessment		

Unit Title	
Unit 8 (iM A1 U1): One Variable Statistics (~ 8 blocks)	
Relevant Standards: Bold indicates priority	
HSS-ID.A.1 HSS-ID.A.2 HSS-ID.A.3	
Essential Question(s)	**Enduring Understanding(s)**
• How can we describe the shape, center, and spread of a distribution? • Which measures of center and spread best describe a data set, and why? • How do outliers affect our summary of data? • What can data tell us about a population, and what can it not tell us?	• The shape of a distribution, whether symmetric or skewed, guides which measures of center and spread are appropriate. • The mean and standard deviation are sensitive to outliers and skew; the median and IQR are resistant to them. • Histograms and box plots display the same data in different ways and are used to compare distributions. • Outliers are identified by comparing data to quartile-based fences, and they can signal important or unusual cases to investigate.
Demonstration of Learning	**Pacing for Unit**

Students will have access to a variety of the following:
• iM Checkpoints
• Formative assessments throughout unit
• Periodic quizzes to check progress
Common Assessment
• End of Unit Assessment
  ○ Part 1: Pear Assessment - more straightforward, one or two steps
  ○ Part 2: On paper, mult-step
	8 Blocks (80 minute lessons)

Family Overview (link below)	**Integration of Technology**
Stats & Geo Family Overview (2026)	• Desmos • Pear Assessment • iM v.360 Digital Applets
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Distribution Histogram Box plot Five-number summary Quartile Interquartile range (IQR) Outlier Symmetric distribution Skewed left or skewed right Mean Median Standard deviation Range	N/A
Opportunities for Interdisciplinary Connections	**Anticipated misconceptions**
• Public health: Box plots compare vaccination rates or disease incidence across regions, and outliers flag communities that need follow-up. • Economics: Household income is skewed right, which is why the median is often reported instead of the mean. • Environmental science: Daily rainfall or river-flow data includes outliers from extreme storms, and students	• Drawing histogram bars with gaps, like a bar graph, or using categories instead of continuous intervals. • Taking one middle value as the median when there is an even number of data values. • Reversing the mean-median relationship for skewed data. • Using mean and standard deviation to describe skewed data with outliers.

compare typical values with spread. • Sports: Points per game for two teams can be compared with box plots, and standard deviation measures consistency. • Civics and social studies: Census data on age, income, or population density across districts is displayed with histograms and summarized with distributions.	• Thinking standard deviation is the average of the deviations from the mean. • Calculating outlier fences from the mean or the range instead of the quartiles.
Connections to Prior Units	**Connections to Future Units**
• Unit 7 (Conditional Probability): relative frequency and two-way tables, used to compare groups. • Grade 6: statistical questions, dot plots, and histograms, with summaries using median and IQR. • Grade 7: mean absolute deviation as a measure of variability; standard deviation extends this idea.	• Future courses (Algebra 2 and Statistics): normal distributions, z-scores, and standard deviation as a unit of measure. • Future courses (AP Statistics): sampling distributions, confidence intervals, and comparing two groups. • Course close: this is the final unit in the course; box plot and standard deviation skills apply to later data work.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Class Reaction Time / Height Census" collecting real-time student data to construct personalized data distributions.	Step-by-step graphic organizer mapping Five-Number Summary values directly to color-coded box plot whiskers and box boundaries.	Construct histograms and box plots using a choice of digital tools (Desmos/Google Sheets), graph paper with physical templates, or an oral presentation explaining quartile boundaries.
LT2	“Real-World Data Shape Mystery" comparing real data graphs (e.g., household income vs. standardized test scores) to see how real-life phenomena create distinct visual distributions.	Visual vocabulary matrix matching distribution curve shapes (symmetric, skewed left/right, uniform, bimodal, bell-shaped) to annotated image cards.	Classify data set distributions by completing physical sorting cards, recording audio commentary explaining symmetry/skew, or writing shape analysis paragraphs.
LT3	"Athlete Performance & Salary Audit" analyzing professional sports stats or salary structures to calculate typical performance metrics.	Dual-column reference sheet displaying manual calculation formulas alongside step-by-step calculator and spreadsheet guides.	Compute summary statistics and generate graphs using spreadsheet software, handheld graphing calculators, or step-by-step written work.
LT4	"The Billionaire Enters the Room" simulation observing how adding an extreme salary value drastically pulls the average while keeping the median stable.	Interactive dynamic dot plot slider demonstrating how dragging a single extreme data point shifts the mean balancing point while the median stays anchored.	Explain the impact of extreme values using a written Claim-Evidence-Reasoning (CER) response, a recorded video demonstration of a data applet, or a small-group presentation.
LT5	“Consistency in Manufacturing Challenge" evaluating quality control graphs from two factories to determine which machine produces more consistent product sizes.	Side-by-side visual spread guide contrasting narrow/clustered distributions (low standard deviation/IQR) with wide/dispersed distributions (high standard deviation/IQR).	Rank data set graphs from least to most variable using a drag-and-drop digital ranking board, written justification cards, or an oral argument.
LT6	"Anomalous Weather Detection" investigating extreme temperature or rainfall records to mathematically confirm whether a climate event qualifies as a statistical outlier.	Step-by-step Outlier Fence decision template with color-coded upper and lower boundary thresholds.	Identify outliers and analyze their statistical impact through written algebraic fence calculations, digital Desmos box plot flags, or peer explanation screencasts.
LT7	"Real Estate Strategy Audit" determining whether a home buyer or seller should report median/IQR or mean/standard deviation to accurately represent local housing prices.	Visual decision flowchart mapping distribution characteristics.	Draft a written statistical recommendation memo, record an oral presentation defending measure selection, or create an annotated decision infographic.

Supporting Multilingual/English Learners (*CELP standards*)			
	Emerging	**Expanding**	**Bridging**
LT1	I can plot data on a pre-labeled histogram grid and match min, Q1, median, Q3, and max to a color-coded box plot template.	I can create a histogram and find the five-number summary to construct a box plot using step-by-step guides and sentence frames.	I can represent numerical data using histograms and calculate the five-number summary to construct and label a complete box plot independently.
LT2	I can match distribution graphs to picture cards labeled symmetric, skewed, uniform, bimodal, and bell-shaped using a visual word bank.	I can describe the shape of a distribution graph using vocabulary sentence frames ("This distribution is [skewed/bimodal] because...").	I can analyze and classify the shape of data distributions using statistical vocabulary (symmetric, skewed, uniform, bimodal, bell-shaped) with written justifications.
LT3	I can calculate mean, median, and IQR using color-coded formula sheets and enter data into graphing technology using visual step cards.	I can calculate mean, median, and interquartile range (IQR) and use technology to display graphs and statistics using guided prompts.	I can calculate mean, median, and IQR manually and using technology, explaining how software generates statistical summary graphs and values.
LT4	I can point out high or low extreme values on a plot and use visual cards showing if the mean shifts left or right compared to the median.	I can describe how extreme values pull the mean away from the median using distribution shape diagrams and cause-and-effect sentence frames.	I can evaluate and explain in writing how extreme values and distribution skewness impact the position of the mean relative to the median.
LT5	I can line up graph cards from narrowest (least spread) to widest (most spread) using visual spread guides.	I can arrange data graphs in order of variability (using standard deviation or IQR) using structured comparison templates and sentence starters.	I can analyze graphical representations of data to order distributions by variability and justify my ranking using standard deviation and IQR.
LT6	I can plug values into a1.5*IQR formula template to circle outliers and match cards showing which statistics change.	I can calculate the 1.5*IQR rule to find outliers and describe their effect on mean, median, IQR, and standard deviation using sentence frames.	I can calculate outliers using the 1.5*IQR rule and explain in detail how outliers affect resistant and non-resistant measures of center and spread.
LT7	I can use a decision flowchart to choose between mean/standard deviation (symmetric) and median/IQR (skewed/outliers).	I can select the best measure of center (mean vs. median) and spread (IQR vs. standard deviation) based on graph shape using sentence starters.	I can choose and justify in writing the most appropriate measures of center and spread for a dataset based on shape, symmetry, and presence of outliers.

Lesson Sequence	**Learning Target**	**Success Criteria/Assessment**
Section A	**Learning Target #1** Represent numerical data with a histogram, and find the five-number summary of a data set and create a box plot. **Learning Target #2** Describe the shape of a distribution using the terms symmetric, skewed, uniform, bimodal, and bell shaped. **Learning Target #3** Calculate the mean, median, and interquartile range of a data set, and use technology to create graphs and calculate statistics.	**Lesson 1 (iM Lesson 2 & 3)** • I can represent data with a histogram. • I can find the five number summary for data and create a box plot. • NOTE: Fix intervals in frequency tables, looking for exposure to creation not 100% proficiency, will revisit with technology in Lesson 3 **Lesson 2 (iM Lesson 4)** • I can use the terms “symmetric”, “skewed” “uniform”,”bimoldal”, and “bell shaped” to describe the shape of a distribution. **Lesson 3 (iM Lesson 5 & 9)** • I can calculate mean, median, and interquartile range for a set of data. • I can use technology to create graphic representations of data and calculate statistics. • NOTE: Spend 10 minutes calculating by hand then transition to technology
Section B	**Learning Target #4** Describe how an extreme value affects the mean and median, and use the shape of a distribution to compare the mean and median.	**Lesson 4 (iM Lesson 10)** • I can describe how an extreme value will affect the mean and median. • I can use the shape of a distribution to compare the mean and median.

	Learning Target #5 Arrange data sets in order of variability, using standard deviation or IQR, from graphic representations. **Learning Target #6** Identify outliers using 1.5 × IQR, and describe how an outlier affects the mean, median, IQR, or standard deviation. **Learning Target #7** Choose and justify measures of center and spread that fit a distribution's shape and any outliers.	**Lesson 5 (iM Lesson 11 & 12)** ● I can arrange data sets in order of variability given graphic representations (using standard deviation or IQR). **Lesson 6 (iM Lesson 14)** ● I can find values that are outliers (using 1.5*IQR). ● I can tell how an outlier will impact mean, median, IQR, or standard deviation.
End of Unit Assessment		

This is a living document.
For the most recent electronic copy of this document scan the QR code

