



Program Transfer Goals

- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

PACING

First Grading Period			Second Grading Period			Third Grading Period			Fourth Grading Period	
Unit 1: Building Blocks	Unit 2: Logic and Reasoning	Unit 3: Coordinate Geometry	Unit 4: Congruence	Unit 5: Similarity	Unit 6: Special Segments	Unit 7: Quadrilate rals and Polygons	Unit 8: 2D Figures	Unit 9: 3D Figures	Unit 10: Circles	Unit 11: Probability
			Semester Exams						Final Exams	

Assurances for a Guaranteed and Viable Curriculum

Adherence to this scope and sequence affords every member of the learning community clarity on the knowledge and skills on which each learner should demonstrate proficiency. In order to deliver a guaranteed and viable curriculum, our team commits to and ensures the following understandings:

Shared Accountability: Responding to the Needs of All Learners

- High levels of learning for all students.
- The district and course formative assessments aligned to the standards for this course support educators and learners in monitoring academic achievement and leveraging interventions.

Shared Understanding: Curriculum Design

- The district curriculum design weaves together the elements of content, skills and assessments in order to adhere to curriculum design at the macro and micro level, ensuring vertical alignment.
- The district curriculum incorporates standards, scope and sequence, enduring understandings, essential questions, performance assessments, and recommended resources.

Interdependence: Curriculum Units

Members of the learning community utilize the curriculum units, plan collaboratively, and reflect on results for continuous improvement.

UNIT 1: POINTS, LINES, AND PLANES

TIMELINE: 3 WEEKS - 1ST GRADING PERIOD

IN THIS UNIT, WE EXPLORE THE FOUNDATIONAL CONCEPTS OF GEOMETRY INCLUDING POINTS, LINES, AND PLANES. WE ALSO INTRODUCE FUNDAMENTAL FORMULAS SUCH AS DISTANCE FORMULA, MIDPOINT FORMULA, SEGMENT ADDITION POSTULATE, AND ANGLE ADDITION POSTULATE.

■ **Transfer Goal:**

- o Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate. This includes familiarity with undefined terms (such as points, lines, and planes), geometric notation, interpreting geometric figures, midpoint formula, and distance formula.
- o Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. This includes solving with midpoint formula, distance formula, and segment addition postulate.

Students will know...

points, lines, and planes are undefined terms; 2 points make a line; 3 points make a plane; Angle Addition Postulate, Segment Addition Postulate, Definition of Midpoint, Definition of Angle Bisector; formulas and tools exist to make measurement easier; equations can be written based on a part and whole relationship

Students will be skilled at...

using midpoint and distance formula; writing and solving equations from given geometric figures; naming geometric figures and identifying relationships; identifying visual representations of one, two, and three dimensional figures; determining the measurement and construction of geometric figures; identifying pairs of angles formed by intersecting lines (vertical angles, linear pairs, complementary, and supplementary)

UNIT 2: LOGIC AND REASONING

TIMELINE: 3 WEEKS - 1ST GRADING PERIOD

IN THIS UNIT, LEARNERS WILL EXPLORE INDUCTIVE AND DEDUCTIVE REASONING, EMPHASIZING CONSTRUCTION OF CONDITIONAL STATEMENTS AS WELL AS THE USE OF THE LAW OF DETACHMENT AND LAW OF SYLLOGISM. THESE CONCEPTS LEAD DIRECTLY TO THE INTRODUCTION OF PROOFS.

■ **Transfer Goal:**

- Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication. This includes differentiating between inductive and deductive reasoning, formulating conditional statements, forming logical arguments (law of detachment and law of syllogism), and justifying reasons through proofs (formal and informal).

Students will know...

the difference between inductive and deductive reasoning; different ways to formulate a proof (two column, flowchart, and paragraph)

Students will be skilled at...

identifying example of inductive and deductive reasoning; writing counterexample to disprove conjectures; identifying and continuing patterns (algebraic and geometric sequences); identifying and forming conditional statements; identifying and forming logical arguments; writing two column algebraic proofs; writing two column geometric proof

UNIT 3: COORDINATE GEOMETRY

TIMELINE: NUMBER OF WEEKS - GRADING PERIOD

IN THIS UNIT, LEARNERS REVISIT CONCEPTS FROM ALGEBRA 1 INCLUDING WRITING LINEAR EQUATIONS, FINDING SLOPE USING SLOPE FORMULA, AND WRITING EQUATIONS OF PARALLEL AND PERPENDICULAR LINES. NEW CONCEPTS IN THE UNIT INCLUDE ANGLE PAIRS FORMED BY TRANSVERSALS AND SPECIAL ANGLE RELATIONSHIPS CREATED WHEN LINES ARE PARALLEL.

■ **Transfer Goal:**

- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. This includes writing equations of lines (coinciding, intersecting, parallel, and perpendicular), identifying angles pairs formed by a transversal and proving line parallel and perpendicular.

Students will know...

parallel lines have the same slope; perpendicular Lines slopes are negative reciprocals; skew lines are on different planes and do not intersect; angle pairs formed by transversals have special relationships and names

Students will be skilled at...

identifying angle pairs formed by a transversal; writing equations based on angle pairs formed by a transversal; writing linear equations of parallel and perpendicular lines given an equation and a point; proving lines parallel based on given information

UNIT 4: CONGRUENCY

TIMELINE: 3 WEEKS - 2ND GRADING PERIOD

LEARNERS WILL REVISIT FUNDAMENTAL PROPERTIES OF TRIANGLES AND PROVING PAIRS OF CONGRUENT TRIANGLES USING THE FIVE TRIANGLE CONGRUENCE THEOREMS.

■ **Transfer Goal:**

- o Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems. This includes identifying congruent figures, especially triangles and writing equations based on geometric figures.

Students will know...

Triangle Sum, Exterior Angle, Base Angles, Equilateral, Classifying Triangles, SAS, SSS, HL, ASA, AAS, CPCTC

Students will be skilled at...

proving triangles congruent by selecting the appropriate congruence theorem (SSS, SAS, ASA, AAS, and HL); writing equations based on triangle properties and theorems; identifying corresponding parts; identifying congruent parts

UNIT 5: SIMILARITY

TIMELINE: 4 WEEKS - 2ND GRADING PERIOD

IN THIS UNIT, LEARNERS WILL EXPLORE THE PROPERTIES OF SIMILAR POLYGONS AND USE PROPORTIONS TO SOLVE FOR MISSING INFORMATION INCLUDING PART TO PART, PART TO WHOLE, AND WHOLE TO WHOLE RELATIONSHIPS. LEARNERS WILL ALSO REVISIT PYTHAGOREAN THEOREM AND EXPLORE BASIC TRIGONOMETRIC RATIOS.

■ **Transfer Goal:**

- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. This includes identifying similar figures, using proportions to find missing measurements (angles and segments), applying pythagorean theorem, using special right triangle ratios, and selecting the appropriate trig ratio for a given triangle.

Students will know...

the attributes of similar figures; the Trig Ratios: Sine, Cosine, and Tangent; when and how to use Pythagorean Theorem, Pythagorean Triples, and Pythagorean Inequalities

Students will be skilled at...

determining if triangles are similar using given information; proving triangles similar by selecting the appropriate theorem (AA,SAS,SSS); using proportions to solve for missing information in similar triangles; understanding and applying dimensional changes; using Pythagorean Theorem (and triples) to find missing side lengths in right triangles; using Pythagorean Inequalities to classify triangles (acute, obtuse, right); applying special right triangle ratios to find missing side lengths; writing and solving trigonometric equations based on given situations and information; identifying angles of elevation and depression

UNIT 6: SPECIAL SEGMENTS IN TRIANGLES

TIMELINE: NUMBER OF WEEKS - GRADING PERIOD

IN THIS UNIT, LEARNERS WILL BE ABLE TO IDENTIFY SPECIAL SEGMENTS IN TRIANGLES AND POINTS OF CONCURRENCY. LEARNERS WILL ALSO BE ABLE TO SOLVE REAL LIFE PROBLEMS BY APPLYING THE PROPERTIES OF THE POINTS OF CONCURRENCY.

■ **Transfer Goal:**

- o Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems. This includes constructing special segments and points of concurrency using a compass and straightedge and identifying real world applications for a given point of concurrency.

Students will know...

Triangle Inequality Theorem; Midsegment Theorem; each special segment's characteristics; Points of Concurrency (orthocenter, centroid, circumcenter, incenter); a single segment can represent more than one special segment in an isosceles and equilateral triangle

Students will be skilled at...

identifying special segments of triangles and points of concurrency; constructing special segments of triangles and points of concurrency; determining if given side lengths form a triangle; using triangle Inequalities to determine a range of possible side lengths; determining relative measures of sides and angles based on given information

UNIT 7: QUADRILATERALS AND POLYGONS

TIMELINE: 4 WEEKS - 3RD GRADING PERIOD

IN THIS UNIT, LEARNERS WILL EXPLORE THE PROPERTIES OF ALL POLYGONS, ESPECIALLY QUADRILATERALS. LEARNERS WILL USE FORMULAS TO FIND SUM OF INTERIOR ANGLES, ONE INTERIOR ANGLE, AND ONE EXTERIOR ANGLE OF ALL REGULAR POLYGONS. LEARNERS WILL APPLY THE PROPERTIES OF POLYGONS AND QUADRILATERALS TO FIND MISSING MEASUREMENTS. LEARNERS WILL APPLY BASIC TRIGONOMETRIC RATIOS TO FIND THE AREA OF REGULAR POLYGONS.

■ **Transfer Goal:**

- o Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication. This includes identifying and proving properties of quadrilaterals and understanding the relationships within the “quadrilateral family tree”
- o Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. This includes writing equations based on a given polygon to solve for missing angle and side measurement.

Students will know...

vocabulary such as convex, concave, regular, interior, exterior, base, legs, mid segments, base angles, and diagonals.

Students will be skilled at...

identifying quadrilaterals by looking at their unique characteristics (angles, sides, diagonals); identifying and naming polygons; selecting appropriate formula to find unknown angle measures; using properties of quadrilaterals to write equations; use midpoint, distance, and slope formulas to verify properties about quadrilaterals

UNIT 8: AREA AND PERIMETER OF TWO-DIMENSIONAL SHAPES

TIMELINE: 2 WEEKS - 3RD GRADING PERIOD

IN THIS UNIT, LEARNERS WILL USE FORMULAS AND PROBLEM SOLVING STRATEGIES TO FIND MISSING MEASUREMENTS IN TWO DIMENSIONAL FIGURES.

■ **Transfer Goal:**

- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. This includes manipulating area formulas to find the area or a unknown dimension.

Students will know...

certain formulas are used to find area and perimeter for different figures; missing information (ex. height) can be found by using known information like area and known dimensions (ex. Length and width)

Students will be skilled at...

finding the area and perimeter of all polygons; finding the area and circumference of circles; developing a plan to find area of irregular and composite figures; using formulas to find missing measurements in polygons and circles; using trig ratios and similar triangles to find missing measurements such as apothem, side length, and perimeter

UNIT 9: SURFACE AREA AND VOLUME

TIMELINE: 3-6 WEEKS - 4TH GRADING PERIOD

IN THIS UNIT, LEARNERS WILL USE FORMULAS AND PROBLEM SOLVING STRATEGIES TO FIND MISSING MEASUREMENTS IN THREE DIMENSIONAL FIGURES.

■ Transfer Goal:

- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. This includes manipulating surface area and volume formulas to find surface area, volume, or an unknown dimension.

Students will know...

surface area is the sum of all of the faces (including bases) of a solid; lateral area is the sum of the faces (excluding the bases) of a solid; difference between surface area and volume; many solids can be “unfolded” into nets; solids can be subtracted (or added) from one another to form composite solids (ex. frustums); the dimensional ratios of perimeter, area, and volume are different from one another but mathematically related; many formulas can be derived and used to find the volume and area of 3D figures

Students will be skilled at...

identifying parts and dimensions of solids (length, width, height, slant height, edge, lateral edge, face, base, vertices, diagonals, nets, and cross sections); applying surface area and volume formulas to 3D figures such as prisms, cylinders, pyramids, cones, and spheres; drawing isometric and orthographic views of solids

UNIT 10: CIRCLES

TIMELINE: 3 WEEKS - 4TH GRADING PERIOD

IN THIS UNIT, STUDENTS WILL DISCOVER AND EXPLORE PROPERTIES OF CIRCLES TO FIND MISSING MEASUREMENTS OF SEGMENTS AND/OR ANGLES.

■ **Transfer Goal:**

- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. This includes using formulas to write equations to find missing information including measures of arcs, angles, and segments.

Students will know...

circles vocabulary including: chords, diameters, secants, tangents, radius, arc, arc length, circumference, sector, segment, inscribed angle, central angle, inscribed quadrilateral; arc lengths and sectors are proportions based on circumference and area; a circle measures 360 degrees; the standard form equation of a circle is based off of pythagorean theorem; a part of the circumference is called an arc; a segment in a circle is a sector minus a triangle; circles are not functions; opposite angles are supplementary when a quadrilateral is inscribed in a circle

Students will be skilled at...

identifying central, inscribed, interior, and exterior angles and their properties; identifying chords, secants, and tangent segments and their properties; writing equations to find missing measures of arcs and angles; writing equations to find missing segment lengths (chords, diameters, secants, and tangents); writing and graphing equations of circles using radius and center; finding the circumference and arc length; finding the area of a sector

UNIT 11: PROBABILITY

TIMELINE: 3 WEEKS - 4TH GRADING PERIOD

IN THIS UNIT, LEARNERS WILL EXPLORE PROBABILITY CONCEPTS INCLUDING SAMPLE SPACE, INDEPENDENT VS. DEPENDENT EVENTS, TWO-WAY TABLES, VENN-DIAGRAMS, PERMUTATIONS, AND COMBINATIONS.

■ Transfer Goal:

- o Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems. This includes using dice, cards, marbles/beads, and coins to demonstrate experiments and their outcomes.
- o Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate. This includes determining sample space, using reasoning to identify permutation problems and combination problems, determining independent and dependent events and variables, and representing events in diagrams or graphs.

Students will know...

sample space is the full set of possible outcomes for an experiment; independent experiments are when each occurrence of one event does not affect the occurrence of another; dependent experiments are when the occurrence of one event does affect the occurrence of another; two-way tables, venn-diagrams, and graphs help display the outcomes of experiments

Students will be skilled at...

determining sample spaces for given experiments; using permutations and combinations; determining probabilities of independent and dependent events; using conditional probability; determining probabilities of mutually exclusive events