

Geometry

At the end of the school year, students will be able to...

**GOAL 6
Numbers Sense and
Computations**

Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.

STANDARD A

Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.

- _____ Locate real number on a number line.
- _____ Simplify and compute with irrational numbers in radical form and as decimal approximations.
- _____ Rename real number in equivalent forms.
- _____ Apply properties of real number to geometric measures.

STANDARD B

Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication and division) and their properties, algorithms, and relationships.

- _____ Set up and solve equations and/or inequalities that represent known geometric relationships.
- _____ Use geometric relationships to set up equations and/or inequalities to find missing values.

STANDARD C

Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.

- _____ Use geometric relationships to set up equations and/or inequalities to find missing values.

STANDARD D

Solve problems using comparisons of quantities, ratios, proportions and percents.

- _____ Use ratios and percents to determine geometric probabilities.
- _____ Use ratios and proportions to determine geometric mean.
- _____ Apply trigonometric ratios to solve right triangles.
- _____ Apply Law of Sines to solve triangles.
- _____ Use ratios and proportions to determine relationships of lengths, angle measures, areas, and volumes among similar figures.

GOAL 7 Measurement

Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

STANDARD A

Measure and compare quantities using appropriate units, instruments, and methods.

- _____ Measure and draw angles using a protractor.
- _____ Analyze given data to compare and order parts of a triangle.
- _____ Apply distance and midpoint formulas to points in one and two dimensions.
- _____ Determine slope between two points on a coordinate plane.

STANDARD B

Estimate measurements and determine acceptable levels of accuracy.

- _____ Use estimation to check reasonableness of answers.
- _____ Use exact and approximate values to represent irrational quantities.

STANDARD C

Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.

- _____ Use formulas to find perimeter, area, surface area and volumes of geometric figures.
- _____ Solve problems using indirect measurements by choosing appropriate technology instruments and/or formulas.

GOAL 8 Algebra

Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

STANDARD A

Describe numerical relationships using variables and patterns.

- _____ Identify and apply Pythagorean triples and special right triangle ratios (30° - 60° - 90° and 45° - 45° - 90°).
- _____ Represent geometric relationships using algebraic expressions and sentences.
- _____ Use patterns to develop formulas representing relationships in polygons.

STANDARD B

Interpret and describe numerical relationships using tables, graphs and symbols.

- _____ Graph linear equations using value tables, slope, and intercepts.
- _____ Graph linear systems of equations.
- _____ Write equations and inequalities for given conditions, involving lines, circles, and trigonometric functions.
- _____ Identify perpendicular and parallel lines using slope.

STANDARD C Solve problems using systems of numbers and their properties.

- _____ Solve linear and quadratic equations and inequalities algebraically.
- _____ Formulate mathematical models to solve geometric problems.

STANDARD D Using algebraic concepts and procedures to represent problem solving.

- _____ Designate a variable to represent an unknown quantity.
- _____ Set up and solve a mathematical sentence the problem.
- _____ Apply the solution to answer the question asked.

GOAL 9 Geometry

Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

STANDARD A Demonstrate and apply geometric concepts involving points, lines, planes and solids.

- _____ Use appropriate terminology to define relationships and properties of geometric figures.
- _____ Perform the six basic constructions: congruent line segments and angles, bisecting line segments and angles, and parallel lines.
- _____ Extend basic constructions to more complex situations.

STANDARD B Identify, describe, classify and compare relationships using points, lines, planes and solids.

- _____ Identify and name basic geometry figures.
- _____ Identify congruent and similar triangles and their corresponding parts.
- _____ Identify and use transformations (translations, reflections, rotations).
- _____ Classify angle relationships, including those formed by parallel lines and a transversal and special pairs of angles.
- _____ Classify polygons and polyhedra and identify their parts and properties.
- _____ Apply the relationships among arcs, chords and angles of circles, and tangent and secant lines.

STANDARD C Construct convincing arguments and proofs to solve problems.

- _____ Prove geometric theorems and relationships among diagrams using postulates, definitions, and previously proven theorem.
- _____ Analyze a geometric problem, arrive at a conclusion and logically justify the conclusion using proofs, including two-column, paragraph, and indirect proofs.
- _____ Derive the Pythagorean Theorem and its converse.
- _____ Solve simple and compound locus problems.

STANDARD D Use trigonometric ratios and circular functions to solve problems.

- _____ Recognize and apply sine, cosine and tangent ratios.
- _____ Use the basic trigonometric functions to solve right triangles.
- _____ Apply the Law of Sines to solve triangles.

**GOAL 10 Data
Collection and Statistical
Analysis**

Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

STANDARD A Organize, describe, and make predictions from existing data.

- _____ Use constructions, drawings, tables, and manipulatives to make predictions and conjectures.
- _____ Collect, organize, analyze and interpret data from examples to infer relationships about geometric figures.

STANDARD B Formulate questions, design data collection methods, gather and analyze data and communicate findings.

- _____ Design methods for collecting data to reach conclusions about geometric figures.
- _____ Determine what assumptions and/or conclusions are valid for a diagram or a given set of conditions.

STANDARD C Determine, describe and apply the probabilities of events.

- _____ Explain the meaning of a probability.
- _____ Use length and area to calculate the probability of an event.
- _____ Determine probabilities and compute statistics to make predictions and inferences.