

Course Title

# IAA Geometry



# INNOVATIVE ARTS ACADEMY

**Course Overview**

This Geometry course covers a wide range of topics, from geometric building blocks like points, lines, and planes, to properties of polygons, circles, and three-dimensional figures, as well as concepts of congruence, similarity, trigonometry, area, surface area, and volume. Through this course, students are expected to apply geometric properties, use coordinate geometry to solve problems, calculate measurements of two- and three-dimensional figures, and engage in formal reasoning and proofs.

**Unit Title**

Foundations of Geometry

**Time Frame**

16 Days

**Unit Title**

Logic and Introduction to Proof

**Time Frame**

20 Days

**Unit Title**

Parallel and Perpendicular Lines

**Time Frame**

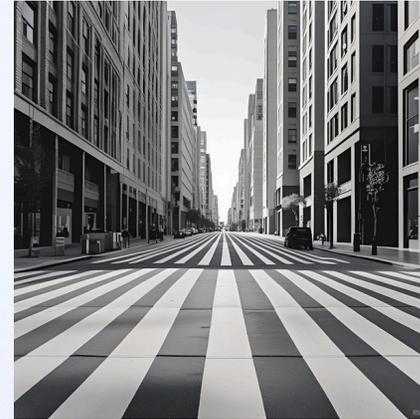
20 Days

**Unit Title**

Triangles and Congruence

**Time Frame**

24 Days



**Focus of the Unit**

This unit is where you learn the basic shapes and rules of geometry like points, lines, and angles, and how to use the algebra you already know to solve geometry problems. It establishes the fundamental building blocks and necessary tools for studying geometry.

**Focus of the Unit**

In this unit, you'll learn how to think like a mathematician, moving from making guesses based on patterns to using logical arguments (called proofs) to show why geometric ideas are true. This unit introduces the structure and language used in mathematical arguments.

**Focus of the Unit**

You'll explore special relationships between lines that cross or never meet, and use logic to solve problems involving the angles they create. This unit applies logical reasoning and proof techniques to understand the relationships formed by intersecting and parallel lines.

**Focus of the Unit**

This unit focuses on triangles and how to use specific rules (called congruence postulates) to prove when two triangles are exactly the same shape and size. Proving triangle relationships is a foundational idea for proving relationships in other figures.

Course Title

# IAA Geometry



# INNOVATIVE ARTS ACADEMY

Course Overview

This Geometry course covers a wide range of topics, from geometric building blocks like points, lines, and planes, to properties of polygons, circles, and three-dimensional figures, as well as concepts of congruence, similarity, trigonometry, area, surface area, and volume. Through this course, students are expected to apply geometric properties, use coordinate geometry to solve problems, calculate measurements of two- and three-dimensional figures, and engage in formal reasoning and proofs.

Unit Title

Special Segments in Triangles & Polygons

Time Frame

16 Days

Unit Title

Similarity and Transformations

Time Frame

20 Days

Unit Title

Right Triangles and Trigonometry

Time Frame

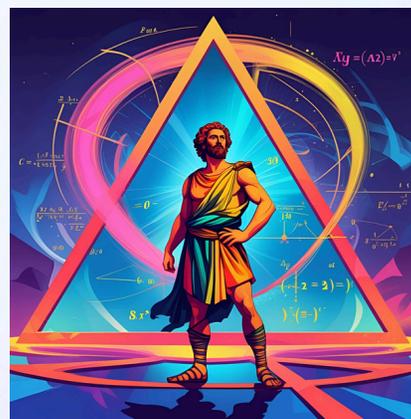
20 Days

Unit Title

Circles and Measurement

Time Frame

24 Days



Focus of the Unit

We'll look at special lines inside triangles like medians and altitudes, and expand our understanding of geometric properties to shapes with more sides, like quadrilaterals and other polygons. This unit continues applying proof and properties to classify and understand different shapes

Focus of the Unit

**Learn about scaling shapes up or down while keeping them the same shape (called similarity) using transformations like dilations. Similar figures create proportional relationships that can be used to solve for missing lengths.**

Focus of the Unit

This unit is all about the special properties of right triangles, using the Pythagorean Theorem and new tools called trigonometry to find missing sides and angles. It connects algebra, geometry, and functions and helps with finding measurements indirectly.

Focus of the Unit

We'll study the unique properties of circles and apply everything you've learned to measure the size and space of shapes in two and three dimensions, like finding area, surface area, and volume. This unit applies formulas and relationships to solve real-world problems.

<b>Unit Title</b>	<b>Foundations of Geometry</b>
<b>Time Frame</b>	16 Days



**INNOVATIVE**  
ARTS ACADEMY

	<b>Essential Question(s)</b>
	<b>How do we use fundamental building blocks and basic algebra to understand geometry?</b>

	<b>Focus of the Unit</b>
	This unit is where you learn the basic shapes and rules of geometry like points, lines, and angles, and how to use the algebra you already know to solve geometry problems. It establishes the fundamental building blocks and necessary tools for studying geometry.

<b>Standards</b>	<b>CC.2.3.HS.A.11 - Apply coordinate geometry to prove simple geometric theorems algebraically.</b>
------------------	---

<b>Learning Targets</b>
I can apply essential algebra skills to solve geometric problems.

<b>Learning Targets</b>
I can identify and define undefined terms (Point, Line, Plane) and defined terms (Segment, Ray, Angle), and differentiate them.

<b>Learning Targets</b>
I can calculate the distance and/or midpoint between two points on a number line or coordinate plane.

<b>Learning Targets</b>
I can classify angles and understand relationships like complementary, supplementary, and vertical angles.



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--

<b>Unit Title</b>	<b>Logic and Introduction to Proof</b>
<b>Time Frame</b>	20 Days



**INNOVATIVE**  
ARTS ACADEMY

**Essential Question(s)**



**How do we use logic, definitions, and postulates to formally prove geometric statements?**

**Focus of the Unit**



In this unit, you'll learn how to think like a mathematician, moving from making guesses based on patterns to using logical arguments (called proofs) to show why geometric ideas are true. This unit introduces the structure and language used in mathematical arguments.

<b>Standards</b>	<b>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</b>
------------------	---

**Learning Targets**

I can identify and distinguish between inductive and deductive reasoning.

**Learning Targets**

I can write conjectures, evaluate them, and provide counterexamples.

**Learning Targets**

I can write conditional (if...then) statements and their converses, using counterexamples.

**Learning Targets**

I can write, analyze, or complete basic geometric proofs involving segments and angles using postulates and axioms.



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--

<b>Unit Title</b>	<b>Parallel and Perpendicular Lines</b>
<b>Time Frame</b>	20 Days



**INNOVATIVE**  
ARTS ACADEMY

	<b>Essential Question(s)</b>
	<b>How do angle relationships and slope help us understand and prove properties of parallel and perpendicular lines?</b>

	<b>Focus of the Unit</b>
	You'll explore special relationships between lines that cross or never meet, and use logic to solve problems involving the angles they create. This unit applies logical reasoning and proof techniques to understand the relationships formed by intersecting and parallel lines.

<b>Standards</b>	<b>CC.2.3.HS.A.3 - Verify and apply geometric theorems related to lines and angles.</b>
------------------	---

<b>Learning Targets</b>
<b>I can use properties of angles</b> formed by intersecting lines to find missing measures.

<b>Learning Targets</b>
I can use properties of angles formed when parallel lines are cut by a transversal (corresponding, alternate interior, etc.) to find missing measures.

<b>Learning Targets</b>
<b>I can use angle relationships</b> to prove that two lines are parallel.

<b>Learning Targets</b>
<b>I can relate slope</b> to perpendicularity and/or parallelism



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--

<b>Unit Title</b>	<b>Triangles and Congruence</b>
<b>Time Frame</b>	24 Days



**INNOVATIVE**  
ARTS ACADEMY

	<b>Essential Question(s)</b>
	<b>How do we classify triangles and use properties and congruence postulates to prove relationships within and between them?</b>

	<b>Focus of the Unit</b>
	This unit focuses on triangles and how to use specific rules (called congruence postulates) to prove when two triangles are exactly the same shape and size. Proving triangle relationships is a foundational idea for proving relationships in other figures.

<b>Standards</b>	<b>CC.2.3.HS.A.2 - Apply rigid transformations to determine and explain congruence.</b>
------------------	---

<b>Learning Targets</b>
I can classify triangles by sides and angles and use their properties

<b>Learning Targets</b>
I can use the Triangle Angle Sum Theorem and Exterior Angle Theorem.

<b>Learning Targets</b>
I can use triangle congruence postulates (SSS, SAS, ASA, AAS, HL) to prove triangles are congruent.

<b>Learning Targets</b>
I can use corresponding parts of congruent triangles (CPCTC) to prove other relationships.



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--

<b>Unit Title</b>	<b>Special Segments in Triangles &amp; Polygons</b>
<b>Time Frame</b>	16 Days



**INNOVATIVE**  
ARTS ACADEMY

	<b>Essential Question(s)</b>
	<b>What special properties do segments in triangles and angles/sides in polygons reveal about their shapes?</b>

	<b>Focus of the Unit</b>
	We'll look at special lines inside triangles like medians and altitudes, and expand our understanding of geometric properties to shapes with more sides, like quadrilaterals and other polygons. This unit continues applying proof and properties to classify and understand different shapes

<b>Standards</b>	<b>CC.2.3.HS.A.3 - Verify and apply geometric theorems regarding triangles and polygons.</b>
------------------	--

<b>Learning Targets</b>
I can define, construct, and understand properties of special segments in triangles (bisectors, medians, altitudes) and their points of concurrency.

<b>Learning Targets</b>
I can discover, prove, and apply polygon angle sum theorems (interior and exterior).

<b>Learning Targets</b>
I can identify and/or use properties of specific quadrilaterals (parallelograms, rectangles, rhombi, squares, trapezoids, kites).

<b>Learning Targets</b>
I can apply the properties of special triangles to find missing sides and angle measures.



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--

<b>Unit Title</b>	<b>Similarity and Transformations</b>
<b>Time Frame</b>	20 Days



**INNOVATIVE**  
ARTS ACADEMY

	<b>Essential Question(s)</b>
	<b>How can transformations create similar figures, and how do we use proportionality to solve problems involving them?</b>

	<b>Focus of the Unit</b>
	Learn about scaling shapes up or down while keeping them the same shape (called similarity) using transformations like dilations. Similar figures create proportional relationships that can be used to solve for missing lengths.

<b>Standards</b>	<b>CC.2.3.HS.A.5 - Create justifications based on transformations to establish similarity of plane figures.</b>
------------------	---

<b>Learning Targets</b>
I can identify and create dilations on the coordinate plane.

<b>Learning Targets</b>
I can identify and use properties of similar polygons and proportional relationships to solve for missing lengths.

<b>Learning Targets</b>
I can prove triangle similarity using postulates (AA, SSS, SAS).

<b>Learning Targets</b>
I can describe how a change in linear dimension affects perimeter, circumference, and area.



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--

<b>Unit Title</b>	<b>Right Triangles and Trigonometry</b>
<b>Time Frame</b>	20 Days



**INNOVATIVE**  
ARTS ACADEMY

	<b>Essential Question(s)</b>
	How do the Pythagorean Theorem, special right triangles, and trigonometry help us find missing measures?

	<b>Focus of the Unit</b>
	This unit is all about the special properties of right triangles, using the Pythagorean Theorem and new tools called trigonometry to find missing sides and angles. It connects algebra, geometry, and functions and helps with finding measurements indirectly.

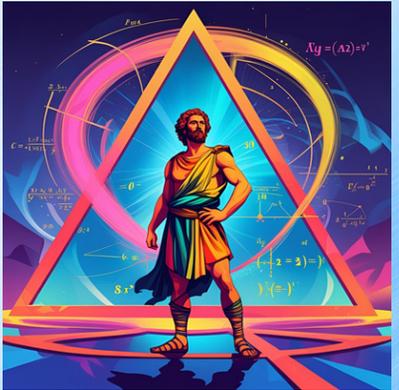
<b>Standards</b>	<b>CC.2.3.HS.A.7 - Apply trigonometric ratios to solve problems involving right triangles; CC.2.2.HS.C.9 - Prove the Pythagorean identity and use it to calculate trigonometric ratios.</b>
------------------	---

<b>Learning Targets</b>
I can use the Pythagorean Theorem and its converse to solve problems involving right triangles.

<b>Learning Targets</b>
I can apply the relationships in 45-45-90 and 30-60-90 triangles to find missing lengths.

<b>Learning Targets</b>
I can use trigonometric ratios (Sine, Cosine, Tangent) to solve problems involving right triangles.

<b>Learning Targets</b>
I can use the trigonometric functions to find missing sides of triangles.



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--

<b>Unit Title</b>	<b>Circles and Measurement</b>
<b>Time Frame</b>	24 Days



**INNOVATIVE**  
ARTS ACADEMY

	<b>Essential Question(s)</b>
	<b>How do we use circle properties and measurement formulas to solve problems involving two- and three-dimensional shapes?</b>

	<b>Focus of the Unit</b>
	We'll study the unique properties of circles and apply everything you've learned to measure the size and space of shapes in two and three dimensions, like finding area, surface area, and volume. This unit applies formulas and relationships to solve real-world problems.

<b>Standards</b>	<b>CC.2.3.HS.A.9 - Determine arc lengths and areas of sectors of circles; CC.2.3.HS.A.12 - Explain and use volume formulas.</b>
------------------	---

<b>Learning Targets</b>
<b>I can identify and use parts of circles</b> and segments associated with circles (radius, diameter, chord, tangent, secant).

<b>Learning Targets</b>
<b>I can calculate circumference, arc measure, and arc length.</b>

<b>Learning Targets</b>
<b>I can discover and apply relationships</b> between arcs, chords, angles, tangents, and secants in a circle to find missing measures.

<b>Learning Targets</b>
<b>I can calculate the area of polygons, circles, sectors, and composite figures.</b>



<b>Resources</b>	<b>HMH text, Kuta Software, Google Drive</b>
------------------	--