8th Grade Math Curriculum

Eighth-grade math covers algebra concepts, laying the groundwork for high school studies in both *Geometry* and *Algebra 2*. You can use this eighth-grade math curriculum as either your main homeschool program or as a supplement to another homeschool curriculum or a traditional school. The following information will explain the steps you should take to meet your child's 8th grade math goals.

What Math Should an 8th Grader Already Know?

An eighth-grade math curriculum covers more than just basic arithmetic. It dives into several different mathematical areas that are crucial for comprehensive learning. Key topics include number sense and operations, solving equations with one and two variables, polynomials, quadratics, geometric transformations, 3D geometric analysis, metric and standard measurement, theoretical and experimental probability.

Mastering these skills is important to help your student succeed in high school by building upon prior knowledge. Here are the topics that eighth graders should already be familiar with:

1. Representing numbers in word, standard, expanded, and scientific notation
2. Understanding and applying ratios and rates
3. Performing multiplication and division with positive and negative rational numbers
4. Solving and graphing single-variable linear inequalities
5. Determining the perimeter and area of two-dimensional shapes
6. Plotting ordered pairs in all four quadrants
7. Computing experimental & theoretical probabilities
8. Calculating depending and independent probability events

If your student needs to revisit seventh-grade math concepts, our curriculum offers flexible grade-level options, allowing access to lessons in the seventh grade.

What Do 8th Graders Learn in Math?

The major math concepts covered for an eighth-grade curriculum are:

- Algebra: Equations
- Algebra: Inequalities
- Algebra: Graphing
- Algebra: Polynomials
- Algebra: Quadratics
- Geometry: Transformations
- Geometry: Plane Geometry
- Geometry: Surface Area & Volume
- Geometry: Right Angle Triangles
- Data Analysis & Statistics

8th Grade Math Goals and Objectives

By the end of the year, your eighth grader will be able to do the following:

1. Recognize and explain rational and irrational numbers
2. Identify and execute transformations of shapes on a coordinate plane
3. Solve and graph systems of linear equations with two variables
4. Graph quadratic equations and identify solutions
5. Define and distinguish between various sampling techniques
6. Calculate statistical measures of real-world data

Special Note Regarding 7th & 8th Grade Math Schedules

We recommend taking two years to complete both a full year-long Algebra course (which also includes pre-Algebra) and a middle school Geometry course.

Start by covering the first half of Algebra (begin with pre-Algebra) and then move into the first half of Geometry during the 7th grade year. You will cover the second halves of both Algebra and Geometry during the 8th grade year, so by the time students finish their 8th grade year, they will have completed both Algebra 1 and middle school level Geometry, and be ready for either Algebra 2 or High School Geometry (whichever is offered for the 9th grade year for their school).

☑ 7th Grade covers Algebra Sessions 1-4; Geometry: Sessions 1-6; Probability

☑ 8th Grade covers Algebra Sessions 5-7; Geometry: Sessions 7-10; Statistics

☑ You may do Algebra all in one year by going through all sessions of Unit 4: Algebra

☑ Please complete Algebra up through Session #4 (Graphing) before starting Geometry

7TH AND 8TH GRADE STUDY SCHEDULE

This is an example of the two-year schedule that covers the first half of both Algebra 1 (with pre-Algebra) and Geometry along with a course in Probability in the 7th Grade year; the second halves of both Algebra 1 and Geometry along with a course in Statistics in the 8th Grade year.

Grade 7: Pre-Algebra, Algebra 1, Geometry & Probability

September Unit 4: Algebra #1 (*Pre-Algebra) Operations on Integers*	**October** Unit #4: Algebra #1 *(Pre-Algebra) Variables, Terms & Expressions*	**November** Unit 4: Algebra #2 *Multi-Step Equations*	**December** *Algebra Review*
January Unit 4: Algebra #3 *Inequalities*	**February** Unit 5: Geometry #1 & 2 *Shapes, Lines & Angles*	**March** Unit 5: Geometry #3-6 *Plane Geometry*	**April** Unit 4: Algebra #4 *Graphing*
May Probability *Mini Math Course*	**June** Math Camp	**July**	**August** 8th Grade Review (Partial)

Grade 8: Algebra 1, Geometry & Statistics

September Unit 4: Algebra #2-4 *Review of Multi-Step Equations, Inequalities & Graphing*	**October** Unit 4: Algebra #5 *Linear Systems of Equations*	**November** Unit 4: Algebra #6 *Polynomials*	**December** *Algebra Review*
January Unit 4: Algebra #7 *Quadratic Equations*	**February** Unit 4: Algebra #7 *Quadratic Equations* Unit 5: Geometry #1 *Transformations*	**March** Unit 5: Geometry #7-8 *3D Geometry: Surface Area & Volume*	**April** Unit 5: Geometry #9-10 *Trigonometry Essentials Mini Math Course*
May Statistics *Mini Math Course*	**June** Math Camp	**July**	**August** 8th Grade Review (Full)

8th Grade Math Lesson Plan – 36 Weeks

Week	Unit/Session	Title	Description	Workbook	Pages	Score
1	Unit 4: Algebra Session 2	Multi-Step Equations	One-Step Equations	Algebra Workbook #3	1-8	
2			Two-Step Equations		9-23	
3	Unit 4: Algebra Session 4	Graphing	Slope-Intercept Form	Algebra Wkbk #5	17-29	
4	Unit 4: Algebra Session 3	Inequalities	Solving Inequalities with Absolute Value	Algebra Wkbk #4	17-26	
5			Graphing Inequalities	Alg Wkbk #5	30-36	
6	Unit 4: Algebra Session 5	Systems of Linear Equations	Linear Equations	Algebra Workbook #6	1-8	
7			Solving with Elimination		9-13	
8			Solving with Substitution		14-28	
9			Systems of Inequalities		29-35	
10	Unit 4: Algebra Session 6	Polynomials	Introducing Polynomials	Algebra Workbook #7	1-12	
11			Factoring Polynomials		13-24	
12			Polynomial Multiplication		25-31	
13			Polynomial Std Form		32-37	
14	Algebra Review					
15	Unit 4: Algebra Session 7	Quadratics	Quadratics	Algebra Workbook #8	1-16	
16			Square Roots		17-26	
17			Quadratic Formula		27-31	
18			Graphing Quadratic Functions		32-34	
19					35-38	
20	Algebra Review					
21	Unit 5: Geo Session 1	Shapes & Constructions	Geometric Transformations	Packet #1 Parts:	1-2,4-6	
22					3, 7	
23	Unit 5: Geo Session 7	Surface Area	Rectangular Prisms	Geometry Workbook #4	1-6	
24			Triangular Prisms		7-11	
25	Unit 5: Geo Session 8	Volume	Prisms & Pyramids		12-13	
26			Cylinders, Spheres		14-19	
27	Geometry Review					
28	Unit 5: Geometry Sessions 9-10	Trigonometry	Angles & Triangles	Geometry Workbook #5	1-15	
29			Sin and Cos Functions		16-21	
30			Tangent Function			
31			Applications			
32	Mini Math Course	Data & Statistics	Mean, Median, Meas Ctr	Statistics Packet Parts:	1-2	
33			Range, IQR, MAD		3-4	
34			Dot Plots & Histograms		5-6	
35			Box Plots & Applications			
36	Full course review					

8th Grade Math Lesson Plan – 36 Weeks

Fall Term (Sept-Dec)

- Week 1: Solving One-Step Equations (Algebra Workbook #3 Pages 1-8)
- Week 2: Solving Two-Step Equations (Algebra Workbook #3 Pages 9-23)
- Week 3: Graphing Slope-Intercept Form (Algebra Workbook #5: Pages 17-29)
- Week 4: Solving Inequalities with Absolute Value (Algebra Workbook #4 Pages 17-26)
- Week 5: Graphing Inequalities (Algebra Workbook #5: Pages 30-36)
- Week 6: Systems of Linear Equations (Algebra Workbook #6: Pages 1-8)
- Week 7: Solving with Elimination (Algebra Workbook #6: Pages 9-13)
- Week 8: Solving with Substitution (Algebra Workbook #6: Pages 14-28)
- Week 9: Solving Systems of Inequalities (Algebra Workbook #6: Pages 29-35)
- Week 10: Introducing Polynomials (Algebra Workbook #7: Pages 1-12)
- Week 11: Factoring Polynomials (Algebra Workbook #7: Pages 13-24)
- Week 12: Polynomial Multiplication (Algebra Workbook #7: Pages 25-31)
- Week 13: Polynomial Standard Form (Algebra Workbook #7: Pages 32-37)
- Week 14: Algebra Review

Winter Term (Jan-March)

- Week 15: Quadratics (Algebra Workbook #8: Pages 1-16)
- Week 16: Quadratics: Square Roots (Algebra Workbook #8: Pages 17-26)
- Week 17: Quadratic Formula (Algebra Workbook #8: Pages 27-31)
- Week 18: Graphing Quadratic Functions (Algebra Workbook #8: Pages 32-34)
- Week 19: Graphing Quadratic Functions (Algebra Workbook #8: Pages 35-38)
- Week 20: Algebra Review
- Week 21: Geometry Transformations Part 1
- Week 22: Geometry Transformations Part 2
- Week 23: Rectangular Prisms (Geometry Workbook #4: Pages 1-6)
- Week 24: Triangular Prisms (Geometry Workbook #4: Pages 7-11)
- Week 25: Prism & Pyramid Volume (Geometry Workbook #4: Pages 12-13)
- Week 26: Cylinder, Cone & Sphere Volume (Geometry Workbook #4: Pages 14-19)
- Week 27: Geometry Review

(continued on next page)

Spring Term (April-May)

- Week 28: Trigonometry 1: Angles and Triangles (Geometry Workbook #5: Pages 1-15)
- Week 29: Trigonometry 2: Sin, Cos Functions (Geometry Workbook #5: Pages 16-21)
- Week 30: Trigonometry 3: Tangent Function
- Week 31: Trigonometry 4: Applications
- Week 32: Data and Statistics (Mean, Median, Measures of Center)
- Week 33: Data and Statistics & Review (Range, IQR, and MAD)
- Week 34: Data and Statistics (Dot Plots & Histograms)
- Week 35: Data and Statistics (Box Plots & Statistics Applications)
- Week 36: Review

Summer Term (June-Aug)

- 10-session Review of all Middle School Content for Graduating 8th Graders!

Completing Algebra 1 in ONE YEAR (instead of two)

The following is for students who are doing a complete Algebra 1 course in one year, starting with pre-Algebra. If you go this route, you will only study algebra so the following year will include a full year of geometry and must also include probability, data and statistics studies.

NOTE: Unit 5 Geometry requires Algebra, so you must complete at least up through Unit 4 Algebra: Session 4 (Graphing) before starting Unit 5: Geometry.

STUDY SCHEDULE: FULL ALGEBRA 1 COURSE

This is an example of the schedule that covers a full year of only Algebra 1 (with pre-Algebra).

September Unit 4: Algebra #1 (*Pre-Algebra) Operations on Integers*	**October** Unit #4: Algebra #1 *(Pre-Algebra) Variables, Terms & Expressions*	**November** Unit 4: Algebra #2 *Multi-Step Equations*	**December** *Algebra Review*
January Unit 4: Algebra #3 *Rational Numbers & Inequalities*	**February** Unit 4: Algebra #4 *Graphing*	**March** Unit 4: Algebra #5 *Systems of Linear Equations*	**April** Unit 4: Algebra #6 *Polynomials*
May Unit 4: Algebra #7: *Quadratics*	**June** Math Camp	**July**	**August** Review before starting next level

The following two pages include a full weekly study schedule.

Algebra 1: Math Lesson Plan – 36 Weeks

Week	Unit/Session	Title	Description	Workbook	Pages	Score
1	Unit 4: Session 1 Pre-Algebra	Operations on Integers	Prime Factorization	Algebra Workbook #1	1-6	
2			Number Line, + - Numbers		7-23	
3			Operations on Integers		24-37	
4		Variables, Terms & Expressions	Exponents	Algebra Workbook #2	1-11	
5			Equivalent Expressions		12-17	
6			Like & Unlike Terms		17-25	
7			Order of Operations		26-36	
8	Pre-Algebra Review					
9	Unit 4: Session 2	Multi-Step Equations	Solving One-Step Equations	Algebra Workbook #3	1-8	
10			Solving Two-Step Equations		9-16	
11			Solving Two-Step Equations		17-23	
12			Word Problems		24-37	
13	Algebra Review					
14	Unit 4: Session 3	Rational Numbers & Inequalities	Rational Numbers & Lines	Algebra Workbook #4	1-11	
15			Inequalities & Absolute Value		12-16	
16			Absolute Value		17-26	
17			Relations & Functions		27-37	
18	Unit 4: Algebra Session 4	Graphing	Coordinate Points	Algebra Workbook #5	1-8	
19			Linear Equations		9-16	
20			Slope-Intercept Form		17-29	
21			Graphing Inequalities		30-36	
22	Algebra Review					
23	Unit 4: Algebra Session 5	Systems of Linear Equations	Linear Equations	Algebra Workbook #6	1-8	
24			Solving with Elimination		9-13	
25			Solving with Substitution		14-28	
26			Systems of Inequalities		29-35	
27	Unit 4: Algebra Session 6	Polynomials	Introducing Polynomials	Algebra Workbook #7	1-12	
28			Factoring Polynomials		13-24	
29			Polynomial Multiplication		25-31	
30			Polynomial Std Form		32-37	
31	Unit 4: Algebra Session 7	Quadratics	Quadratics	Algebra Workbook #8	1-16	
32			Square Roots		17-26	
33			Quadratic Formula		27-31	
34			Graphing Quadratic Functions		32-34	
35					35-38	
36	Algebra Review					

Algebra 1 Math Lesson Plan – 36 Weeks

Fall Term (Sept - Dec)

- Week 1: Prime Factorization (Algebra Workbook #1 Pages 1-6)
- Week 2: Number Line, Positive & Negative Numbers (Algebra Workbook #1 Pages 7-23)
- Week 3: Operations on Integers (Algebra Workbook #1 Pages 24-37)
- Week 4: Exponents (Algebra Workbook #2 Pages 1-11)
- Week 5: Equivalent Expressions (Algebra Workbook #2 Pages 12-17)
- Week 6: Like & Unlike Terms (Algebra Workbook #2 Pages 17-25)
- Week 7: Order of Operations (Algebra Workbook #2 Pages 26-36)
- Week 8: Algebra Review
- Week 9: Solving One-Step Equations (Algebra Workbook #3 Pages 1-8)
- Week 10: Solving Two-Step Equations (Algebra Workbook #3 Pages 9-16)
- Week 11: Solving Two-Step Equations (Algebra Workbook #3 Pages 17-23)
- Week 12: Word Problems (Algebra Workbook #3 Pages 24-37)
- Week 13: Algebra Review

Winter/Spring Term (Jan - May)

- Week 14: Rational Numbers & Number Lines (Algebra Workbook #4 Pages 1-11)
- Week 15: Inequalities & Absolute Value (Algebra Workbook #4 Pages 12-16)
- Week 16: Solving Inequalities with Absolute Value (Algebra Workbook #4 Pages 17-26)
- Week 17: Relations & Functions & Review (Algebra Workbook #4 Pages 27-37)
- Week 18: Coordinate Points (Algebra Workbook #5: Pages 1-8)
- Week 19: Linear Equations (Algebra Workbook #5: Pages 9-16)
- Week 20: Slope-Intercept Form (Algebra Workbook #5: Pages 17-29)
- Week 21: Graphing Inequalities (Algebra Workbook #5: Pages 30-36)
- Week 22: Algebra Review
- Week 23: Systems of Linear Equations (Algebra Workbook #6: Pages 1-8)
- Week 24: Solving with Elimination (Algebra Workbook #6: Pages 9-13)
- Week 25: Solving with Substitution (Algebra Workbook #6: Pages 14-28)
- Week 26: Solving Systems of Inequalities (Algebra Workbook #6: Pages 29-35)
- Week 27: Introducing Polynomials (Algebra Workbook #7: Pages 1-12)
- Week 28: Factoring Polynomials (Algebra Workbook #7: Pages 13-24)
- Week 29: Polynomial Multiplication (Algebra Workbook #7: Pages 25-31)
- Week 30: Polynomial Standard Form (Algebra Workbook #7: Pages 32-37)
- Week 31: Quadratics (Algebra Workbook #8: Pages 1-16)
- Week 32: Quadratics: Square Roots (Algebra Workbook #8: Pages 17-26)
- Week 33: Quadratic Formula (Algebra Workbook #8: Pages 27-31)
- Week 34: Graphing Quadratic Functions (Algebra Workbook #8: Pages 32-34)
- Week 35: Graphing Quadratic Functions (Algebra Workbook #8: Pages 35-38)
- Week 36: Algebra Review

Completing Geometry in ONE YEAR (instead of two)

The following is for students who wish to study a complete Geometry course in one year.

NOTE: Unit 5 Geometry requires Algebra, so you must complete at least up through Unit 4 Algebra: Session 4 (Graphing) before starting Unit 5: Geometry.

STUDY SCHEDULE: FULL GEOMETRY COURSE

This is an example of the schedule that covers a full year of Geometry (prerequisite: Algebra 1).

September Unit 5: Geometry #1 *Shapes & Constructions*	**October** Unit #5: Geometry #2 *Angles*	**November** Unit 5: Geometry #3 *Triangles*	**December** Unit 5: Geometry #4 *Circles*
January Unit 5: Geometry #5 *Plane Geometry*	**February** Unit 5: Geometry #6 *Similarity*	**March** Unit 5: Geometry #7 *Surface Area*	**April** Unit 5: Geometry #8 *Volume*
May Unit 5: #9 & 10: *Right Angle Geometry (Trigonometry Essentials)*	**June** Probability	**July** Statistics	**August** Full Upper Level Review (Algebra 1 & Geometry)

The following three pages include a full weekly study schedule.

Geometry: Math Lesson Plan – 34 Weeks

Week	Unit/Session	Title	Description	Workbook / Assignment	Score
1	Unit 5: Session 1	Shapes & Constructions	Basic Shapes	#1: p. 1-15	
			First Build Challenge*	Eggstronauts	
2			Constructing Shapes	#1: p. 16-33	
				Geometric Designs	
3			Geometric Transformations	Packet #1 Parts 1-2,4-6	
4			Geometric Transformations	Packet #1 Parts 3, 7	
				Foldable Art Project	
				Escape Room	
5	Unit 5: Session 2	Angles	Bisecting & Constructing Shapes	#2: p. 1-21	
			Second Build Challenge*	Flashlight Laser Maze	
6			Types of Angles	Packet #2 Part 1 (Angles)	
				Solve & Color	
				Mazes	
7			Angles in Triangles	Packet #2 Part 2 (Triangles)	
				Card Sort	
				Review Booklet	
8	Unit 5: Session 3	Triangles	Properties of Triangles	#2: p. 22-36	
				Error Analysis	
			Third Build Challenge*	Truss Bridges	
9			Angle & Triangle Review	Task Cards	
				Study Guide & Test	
				Kaleidocycle	
				Hexaflexagon Template	
10	Unit 5: Session 4	Circles	Radius, Diameter, Circumference & Area	#3: p. 1-4	
				Packet #3: Circles	
			Fourth Build Challenge*	Forestry Lab	
11			Properties of Circles	Introductory Activity	
				Circumference Circle Mazes	
				Area Circle Mazes	
				Circle Escape Room	
				Möbius Activity	

*Allow 2-4 weeks to complete Challenges

Week	Unit/Session	Title	Description	Workbook / Assignment	Score
12	Unit 5: Session 5	Plane Geometry	Rectangles & Parallelograms	#3: p. 5-11	
				Packet: Plane p. 1-3	
				Corridor Math Game	
			Fifth Build Challenge*	Spacecraft Lab	
13			Triangles & Trapezoids	#3: p. 12-17	
				Packet: Plane p. 5-7	
				Area of Triangles	
				Spin to Ten Quadrilaterals	
14			Composite Shapes	#3: p. 18-20	
				Packet: Plane p. 9-11	
				Area of Composite Figures	
15			Composite Problem Solving	#3: p. 21-22	
				Packet: Plane p. 13-15	
				Round Table Composites	
			Review	Packet: Plane Quiz p. 17-18	
16	Unit 5: Session 6	Similarity	Intro to Similarity	#3: p. 23-30	
			Similarity	Packet: Similarity p. 1-3	
17			Scale Drawings	Packet: Similarity p. 5-7	
				Scavenger Hunt	
18			Practice with Plane & Similarity	10 Stations Review	
				Fix and Flip Design	
19			Review	Study Guide p.1-3	
				Similarity Test p.4-5	
20	Unit 5: Session 7	Surface Area	Intro to 3D Figures & Nets	Packet: Surf Area p. 1-3	
			Sixth Build Challenge*	Solar Cookies	
			3D Shapes	#4: p. 1-7	
			Rectangular Prisms	Packet: Surf Area p. 5-7	
21			Surface Area: Triangular Prisms	Packet: Surf Area p. 9-11	
				#4: p. 8-9	
				Solve & Color	
			Quiz: Surface Area	Packet: Surf Area p.13-14	
22			Pyramids	Packet: Surf Area p. 15-17	
				#4: p.10-11	
			Prisms & Pyramids	Scavenger Hunt	
				Surface Area Dominoes	
				Surface Area Match Up	
23				Packet: Surf Area p. 19-21	
			Surface Area Applications	28 Station Review	
			Review (Study Guide & Test)	Study Guide Review & Test	

Week	Unit/Session	Title	Description	Workbook / Assignment	Score
24	Unit 5: Session 8	Volume	Cross Sections of 3D Figures	Packet: Volume p. 1-3	
				Cross Section Card Sort	
			Volume of Rectangular Prisms	Packet: Volume p. 5-7	
				#4: p. 12	
				Two Mazes	
			Seventh Build Challenge*	Geology Rock Hound	
25			Volume of Triangular Prisms	Packet: Volume p. 9-11	
				#4: p.13	
				Cut and Paste Activity	
				Scavenger Hunt	
26			Review Quiz	Packet: Volume p. 13-14	
			3D Composite Prisms	Packet: Volume p. 15-17	
				Error Analysis	
			Volume of Cylinders & Spheres	#4: p. 14-17	
27			Applications of Volume	Packet: Volume p. 19-21	
				Task Cards	
			Review	Study Guide p. 1-3	
				Volume Test p. 5-6	
				#4: p. 18-19	
28	Unit 5: Sessions 9 & 10	Right Angle Geometry	Review: Angles, Triangles & Pythagorean Theorem	#5: p.1-15	
				Scavenger Hunt	
29			Trigonometric Functions: Sine & Cosine	#5: p.16-21	
				Guided Notes p. 1-11	
				Activity: Sum 'Em Up	
30			Trigonometric Functions: Sine, Cosine & Tangent	Guided Notes p.12-19	
				8 Stations	
31			Applications	#5: p. 22-24	
				Guided Notes p. 20-22	
32	Review: Upper Level (Algebra & Geometry): 10 sessions			Review Packet	
33					
34	Standardized Geometry Test			Grades 7-8th Standardized Test	

*Allow 2-4 weeks to complete Challenges