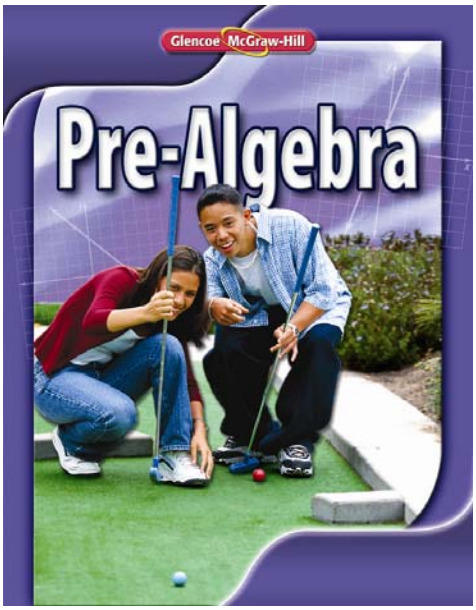
Glencoe

Academic Content Standards
Grade Seven

Ohio



Pre-Algebra

Ohio Academic Content Standards, Grade 7, Correlated to Glencoe's *Ohio Pre-Algebra*

Lessons in which the benchmark and/or grade level indicator is the primary focus are indicated in **bold**.

Standard 1 Number, Number Sense and Operations			
Number and Number Systems		**Lesson(s)**	**Page Number(s)**
N1.	Demonstrate an understanding of place value using powers of 10 and write large numbers in scientific notation.	**9-5**	**493-498**
N2.	Explain the meaning of exponents that are negative or 0.	**9-1, 9-4**	**471-475, 486-491**
N3.	Describe differences between rational and irrational numbers; e.g., use technology to show that some numbers (rational) can be expressed as terminating or repeating decimals and others (irrational) as non-terminating and non-repeating decimals.	**3-2, 10-2, Extend 10-4**	**128-133, 543-548, 564**
Meaning of Operations			
N4.	Use order of operations and properties to simplify numerical expressions involving integers, fractions and decimals.	**1-1, 1-3, 3-3, 3-4, 3-5, 3-6, 4-1**	**5-9, 18-23, 134-139, 141-158, 171-176**
N5.	Explain the meaning and effect of adding, subtracting, multiplying and dividing integers; e.g., how adding two integers can result in a lesser value.	**2-2, 2-3, 2-4, 2-5**	**69-74, 76-80, 83-88, 90-95**

*The first letter of each Content Standard has been affixed to the Indicator for ease of reference.

LA = Looking Ahead to Next Year; CSB = Concepts and Skills Bank

Computation and Estimation			
N6.	Simplify numerical expressions involving integers and use integers to solve real-life problems.	**2-1, 4-2**	**61-66, 178-183**
N7.	Solve problems using the appropriate form of a rational number (fraction, decimal or percent).	**3-1, 7-1, 7-4**	**121-127, 331-336, 351-355**
N8.	Develop and analyze algorithms for computing with percents and integers, and demonstrate fluency in their use.	**Explore 2-2, 2-2, Explore 2-3, 2-3, Explore 2-4, 2-4, Explore 2-5, 2-5, Explore 7-3, 7-3, 7-4, 7-5**	**67-80, 82-95, 343-355, 357-362**
N9.	Represent and solve problem situations that can be modeled by and solved using concepts of absolute value, exponents and square roots (for perfect squares).	**9-1,** Explore 10-1**, 10-1**	**471-475,** 535, **536-542**
Standard 2 Measurement			
Measurement Units			
M1.	Select appropriate units for measuring derived measurements; e.g., miles per hour, revolutions per minute.	**6-1, 6-2, 6-3**	**265-280**
M2.	Convert units of area and volume within the same measurement system using proportional reasoning and a reference table when appropriate; e.g., square feet to square yards, cubic meters to cubic centimeters.	OHxxx	OHxxx
Use Measurement Techniques and Tools			
M3.	Estimate a measurement to a greater degree of precision than the tool provides.	CSB-12	879
M4.	Solve problems involving proportional relationships and scale factors; e.g., scale models that require unit conversions within the same measurement system.	**6-6, 6-7, 6-8, 6-9**	**294-299, 301-317**
M5.	Analyze problem situations involving measurement concepts, select appropriate strategies, and use an organized approach to solve narrative and increasingly complex problems.	**5-1, 6-3, 11-6, 11-7, 11-8, 11-9, Explore 12-2, 12-2, 12-3, Explore 12-4, 12-4, Explore 12-5, 12-5, Explore 12-6, 12-6, 12-7, Explore 12-8, 12-8**	**221-226, 275-280, 624-647, 670-688, 690-715**
M6.	Use strategies to develop formulas for finding area of trapezoids and volume of cylinders and prisms.	**11-6**, Explore 12-2, **12-2, 12-3**	**624-630,** 670, **671-681**
M7.	Develop strategies to find the area of composite shapes using the areas of triangles, parallelograms, circles and sectors.	**11-9**	**642-647**
M8.	Understand the difference between surface area and volume and demonstrate that two objects may have the same surface area, but different volumes or may have the same volume, but different surface areas.	12-3, 12-5, 12-6,	677-681, 691-701

M9.	Describe what happens to the surface area and volume of a three-dimensional object when the measurements of the object are changed; e.g., length of sides are doubled.	12-2, 12-4, 12-5, 12-6, 12-7, **Explore 12-8, 12-8**	671-676, 683-688, 691-707, **708-715**
Standard 3 Geometry and Spatial Sense			
Characteristics and Properties			
G1.	Use proportional reasoning to describe and express relationships between parts and attributes of similar and congruent figures.	**6-7, 6-9,** Explore 12-8**, 12-8**	**301-306, 313-317,** 708, **709-715**
G2.	Determine sufficient (not necessarily minimal) properties that define a specific two-dimensional figure or three-dimensional object. For example:	**10-3, 11-4, 11-5, Explore 12-1, 12-1**	**550-555, 611-615, 617-622, 663-669**
	a. Determine when one set of figures is a subset of another; e.g., all squares are rectangles.		
	b. Develop a set of properties that eliminates all but the desired figure; e.g., only squares are quadrilaterals with all sides congruent and all angles congruent.		
G3.	Use and demonstrate understanding of the properties of triangles. For example:	**10-3, Explore 10-4, 10-4**	**550-555, 557-563**
	a. Use Pythagorean Theorem to solve problems involving right triangles.		
	b. Use triangle angle sum relationships to solve problems.		
G4.	Determine necessary conditions for congruence of triangles.	**11-2**	**598-604**
G5.	Apply properties of congruent or similar triangles to solve problems involving missing lengths and angle measures.	**6-7, 6-8, 6-9, 11-2**	**301-317, 598-604**
Spatial Relationships			
G6.	Determine and use scale factors for similar figures to solve problems using proportional reasoning.	**Explore 6-7, 6-7, 6-8, 6-9**	**300-317**
Transformations and Symmetry			
G7.	Identify the line and rotation symmetries of two-dimensional figures to solve problems.	2-7, **11-3**	101-106**, 605-610**
G8.	Perform translations, reflections, rotations and dilations of two dimensional figures using a variety of methods (paper folding, tracing, graph paper).	**2-7, 6-8, 11-3**	**101-106, 307-312, 605-610**
Visualization and Geometric Models			
G9.	Draw representations of three-dimensional geometric objects from different views.	**Explore 12-1, 12-1**	**663-669**
Standard 4 Patterns, Functions and Algebra			
Use Patterns, Relations and Functions			
P1.	Represent and analyze patterns, rules and functions with words, tables, graphs and simple variable expressions.	**1-4, Explore 1-5, 1-5, Extend 1-5,** 8-2	**25-38,** 401-405
P2.	Generalize patterns by describing in words how to find the next term.	**8-2**	**401-405**
P3.	Recognize and explain when numerical patterns are linear or nonlinear progressions; e.g., 1, 3, 5, 7... is linear and 1, 3, 4, 8, 16... is nonlinear.	**9-7**	**504-509**

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Use Algebraic Representation			
P4.	Create visual representations of equation-solving processes that model the use of inverse operations.	4-1, Explore 4-2, 4-2, **Explore 4-5, Explore 5-2**	171-183, **197-198, 228**
P5.	Represent linear equations by plotting points in the coordinate plane.	**8-3, 8-4,** 8-6	**406-417,** 427-431
P6.	Represent inequalities on a number line or a coordinate plane.	**5-3,** 5-4, 5-5, **CSB6**	**234-239,** 241-253, **866-867**
P7.	Justify that two forms of an algebraic expression are equivalent, and recognize when an expression is simplified; e.g., $4m = m + m + m + m$ or $a \cdot 5 + 4 = 5a + 4$.	**4-2, 9-3,** LA 2, LA 3	**178-183, 481-485,** LA6-LA11
P8.	Use formulas in problem-solving situations.	**5-1, 10-5, 11-6, 11-7, 11-8, 12-2, 12-3, 12-4, 12-5, 12-6**	**221-226, 565-570, 624-641, 671-681, 683-688, 691-695, 697-701**
P9.	Recognize a variety of uses for variables; e.g., placeholder for an unknown quantity in an equation, generalization for a pattern, formula.	**1-2,** Extend 1-2**, 1-5,** 5-1, **8-2,** 10-5, 11-6, 11-7, 11-8, 12-2, 12-3, 12-4, 12-5, 12-6	**11-16,** 17, **33-37,** 221-226**, 401-405,** 565-570, 624-641, 671-681, 683-688, 691-695, 697-701
Analyze Change			
P10.	Analyze linear and simple nonlinear relationships to explain how a change in one variable results in the change of another.	**8-4, 8-5, 9-7,** 9-8, 9-9	**412-424, 504-509,** 510-514, 516-520
P11.	Use graphing calculators or computers to analyze change; e.g., distance-time relationships.	**Explore 8-6, Extend 8-6, Extend 11-9**	**426, 432, 648-649**
Standard 5 Data Analysis and Probability Standard			
Data Collection			
D1.	Read, create and interpret box-and-whisker plots, stem-and-leaf plots, and other types of graphs, when appropriate.	**Explore 1-6, 1-6, Extend 1-6, 8-9, 13-2, 13-4. Extend 13-4, 13-5, Extend 13-5, CSB14, CSB15**	**39-48, 448-452, 737-742, 750-763, 882-885**
D2.	Analyze how decisions about graphing affect the graphical representation; e.g., scale, size of classes in a histogram, number of categories in a circle graph.	**13-5, CSB15**	**757-762, 884-885**
Statistical Methods			
D3.	Analyze a set of data by using and comparing combinations of measures of center (mean, mode, median) and measures of spread (range, quartile, interquartile range), and describe how the inclusion or exclusion of outliers affects those measures.	**Explore 13-1, 13-1, Extend 13-1, 13-3**	**729-736, 743-749**
D4.	Construct opposing arguments based on analysis of the same data, using different graphical representations.	**13-1, 13-3**	**730-735, 743-749**

D5.	Compare data from two or more samples to determine how sample selection can influence results.	**13-7**	**771-776**
D6.	Identify misuses of statistical data in articles, advertisements, and other media.	**CSB15**	**884-885**
Probability			
D7.	Compute probabilities of compound events; e.g., multiple coin tosses or multiple rolls of number cubes, using such methods as organized lists, tree diagrams and area models.	**Extend 13-8, 13-9, 13-10**	**782-788, 790-795**
D8.	Make predictions based on theoretical probabilities, design and conduct an experiment to test the predictions, compare actual results to predicted results, and explain differences.	**Explore 13-10, Extend 13-10**	**789, 796-797**
Standard 6 Mathematical Processes			
Benchmark: Grade Band 5-7			
MPA.	Clarify problem-solving situation and identify potential solution processes; e.g., consider different strategies and approaches to a problem, restate problem from various perspectives.	**0-1, 0-2**	**P6-P11**
MPB.	Apply and adapt problem-solving strategies to solve a variety of problems, including unfamiliar and non-routine problem situations.	**Extend 9-9**	**521**
MPC.	Use more than one strategy to solve a problem, and recognize there are advantages associated with various methods.	*Used throughout the text. For example:* 4-6, 7-6, 8-9, 10-5	*Used throughout the text. For example:* 205-209, 364-369, 448-452, 565-570
MPD.	Recognize whether an estimate or an exact solution is appropriate for a given problem situation.	*Used throughout the text. For example:* 7-4, 8-9, 11-6, 11-8	*Used throughout the text. For example:* 351-355, 448-452, 624-630, 636-641
MPE.	Use deductive thinking to construct informal arguments to support reasoning and to justify solutions to problems.	*Used throughout the text. For example:* 3-5, 4-4, 5-4, 11-3	*Used throughout the text. For example:* 147-152, 191-196, 241-247, 605-610
MPF.	Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures.	*Used throughout the text. For example:* 2-1, Explore 2-4, Explore 6-7, Explore 8-6	*Used throughout the text. For example:* 61-66, 82, 300, 426
MPG	Relate mathematical ideas to one another and to other content areas; e.g., use area models for adding fractions, interpret graphs in reading, science and social studies.	*Used throughout the text. For example:* 3-3, 3-5, 7-1, Explore 7-3	*Used throughout the text. For example:* 134-139, 147-152, 331-336, 343-344
MPH.	Use representations to organize and communicate mathematical thinking and problem solutions.	Extend 1-2, LA 1	17, LA2-LA5

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MPI.	Select, apply, and translate among mathematical representations to solve problems; e.g., representing a number as a fraction, decimal or percent as appropriate for a problem.	*Used throughout the text. For example:* 7-1, 7-2, 7-4, 8-3	*Used throughout the text. For example:* 331-342, 351-355, 406-411
MPJ.	Communicate mathematical thinking to others and analyze the mathematical thinking and strategies of others.	*Used throughout the text. For example:* 4-3, 6-7, 8-5, 11-5	*Used throughout the text. For example:* 184-189, 301-306, 418-424, 617-622
MPK.	Recognize and use mathematical language and symbols when reading, writing and conversing with others.	*Used throughout the text. For example:* 6-4, 8-5, Explore 11-2, Explore 12-4	*Used throughout the text. For example:* 281-285, 418-424, 596-597, 682