



INDIANA ACADEMIC STANDARDS FRAMEWORKS

Mathematics: Grade 6

Overview

The *Algebra and Functions* domain is introduced in grade six and signifies a shift toward symbolic algebra and functions. The early grades built algebraic thinking by having students consider unknown quantities within arithmetic problems and work with properties of operations.

Grade four students are expected to show how the commutative and associative properties operate in numerical expressions.^{4.CA.3} In grade five, students apply these properties as they solve real-world problems with whole numbers, fractions, and decimals. In grade six, students apply the order of operations to evaluate numerical expressions^{6.NS.5} and use the properties of operations to create equivalent linear expressions and justify that two expressions are equivalent.^{6.NS.7} They also use variables to write algebraic expressions to solve real-world problems and evaluate those expressions for given values.^{6.AF.1} These experiences support work in grade seven when students create equivalent linear expressions that include factoring out a common number,^{7.AF.1} and these progressions of learning become the foundation of all equation and function work through grade eight and high school.

While students in kindergarten through grade five encountered verbal and numerical equations, and later elementary students used equations to model relationships between quantities or justify their reasoning, students in grade six begin to regularly use algebraic expressions, equations, and inequalities to model real-world problems. They extend their understanding of what it means to solve an algebraic equation^{6.AF.2} and they solve simple one-step linear equations with one variable.^{6.AF.3-4} In grade seven, students solve two-step linear equations and inequalities with one variable^{7.AF.3-4} and by grade eight they solve linear equations and inequalities with rational number coefficients in one variable fluently.^{8.AF.1}

Algebra and Functions	
Learning Outcome	Students evaluate algebraic expressions, write algebraic expressions to represent quantities in context, and create equivalent algebraic expressions.
Standard	6.AF.2: Demonstrate which values from a specified set, if any, make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true. (E)
Evidence Statements	Academic Vocabulary
<ul style="list-style-type: none">Explain that a variable represents a number or a specific set of numbers.Given an algebraic equation or inequality, make predictions as to the values that may be solutions. Use substitution to determine which, if any, predictions are true.	<ul style="list-style-type: none">Algebraic equationAlgebraic inequalitySetSubstitutionEquationInequality

<ul style="list-style-type: none"> • Use substitution to determine which, if any, values from a given set make an algebraic equation true. • Use substitution to determine which, if any, values from a given set make an algebraic inequality true. 	<ul style="list-style-type: none"> • True • Value • Solution • Set of numbers
Clarification Statements	Common Misconceptions
<ul style="list-style-type: none"> • This standard relates closely to students solving algebraic equations (6.AF.3) and writing and graphing inequalities (6.AF.4), therefore, teachers may choose to integrate these standards. • Teachers should provide multiple real-world situations in which students must determine if a single value solution or multiple solutions are required. Students should practice writing algebraic equations or inequalities from real-world situations, and be encouraged to make predictions as to the values of possible solutions. Substitution can then be used to determine which predictions are true. • As students work with algebraic equations, it is important for teachers to emphasize that both sides of the equation must be balanced, or equal, for the solution to be true. • When providing possible solutions to inequalities, it is appropriate to include numbers less than zero, including fractions and decimals. Teachers may also want to provide students with a number line as they begin working with algebraic inequalities. • Grade six Integrated STEM standards 6.AM.1 and 6.IPS.2 integrate well with this standard. 	<ul style="list-style-type: none"> • When substituting a value for a variable, students may not follow through with the given operation. For example, students may believe $4x$ with $x = 3$ equals 43. • Students may misinterpret a variable as a label. • Students may not know how to interpret the symbols for inequalities. • Students may not understand that equations and inequalities are both number sentences.
Looking Back	Looking Ahead
This concept is not specifically addressed in the Indiana Academic Standards prior to this grade level.	This concept is not specifically addressed in the Indiana Academic Standards in the subsequent grade levels.
Instructional Resources	
<ul style="list-style-type: none"> • Mathematics Grades 5-6 Vertical Articulation Guide • Mathematics Grades 6-8 Vertical Articulation Guide • Learning Progressions & Content Supports: Grade 6 through Grade 8 • Implementing the Mathematical Process Standards: Grades Six through Eight • Illustrative Mathematics-Exponent Experimentation 3 	

- [Illustrative Mathematics-Log Ride](#)
- [Andrew Stadel-Woody's Raise 3 Act Math](#)
- [Tools for Teachers-Who Let the Letters Out? \(Login Instructions\)](#)
- [Open Up Resources-Expressions and Equations-Lesson 2](#)
- [PhET: Equality Explorer](#)

Universal Supports for All Learners

- [2024 Content Connectors](#)
- [Universal Design for Learning Playbook](#)
- [UDL Guideline Infographic, from Learning Designed](#)
- [UDL Tips from CAST](#)
- [Mathematics Learning Recovery Series: Part 2-Addressing the Gaps in Student Learning](#)
- [Mathematics Learning Recovery Series: Part 3-Instructional Strategies for All Learners](#)

Instructional Strategies

- [What Works Clearinghouse-Concrete-Semi-Concrete-Abstract Video \(Print Recommendations\)](#)
- [What Works Clearinghouse-Clear & Concise Mathematical Language Video \(Print Recommendations\)](#)
- [NYSED-Frayer Vocabulary Model Scaffolding Example & Template](#)
- [Magma Math: Math Teaching Practices](#)
- [Problem Solving Instructional Support](#)
- [WIDA-Doing and Talking Mathematics: A Teachers Guide to Meaning-Making with English Learners](#)
- [Virginia Department of Education Students with Disabilities in Mathematics Frequently Asked Questions](#)

Assessment Considerations

- [ILEARN Test Blueprint: Mathematics 2025-2026 \(Spreadsheet\)](#)
- [ILEARN Test Blueprint: Mathematics 2025-2026 \(PDF\)](#)
- [IDOE Released Items Repository](#)
- [I AM - Indiana's Alternate Measure](#)
- [Quality Mathematic Items for Classroom Assessments \(Featuring New ILEARN Item Specifications\)](#)
- [Grade 6 ILEARN Math Desmos 4-Function Calculator](#)
- [UDL Assessment Strategies](#)

Interdisciplinary Connections

Coming Soon

Disciplinary Literacy

Coming Soon

Contact IDOE's [Office of Teaching and Learning](#) with any questions.

