



INDIANA ACADEMIC STANDARDS FRAMEWORKS

Mathematics: Grade 6

Overview

The domain of *Ratios and Proportional Reasoning* rests on several important progressions of learning from elementary grades including multiplication and division, fractions, and modeling real-world relationships. It also begins important middle school progressions such as variables, algebraic expressions and equations, and functions in multiple representations. Additionally, this domain provides rich context for modeling real-world problems.

Students in grade six understand a ratio as a comparison of two quantities and use ratio language to express mathematical thinking within a context. They understand the multiplicative nature of unit rates and use them to solve problems, and they use tables and other representations to compare ratios and identify equivalent ratios. The understanding of ratios and rates in grade six supports learning of proportional relationships in grade seven as students understand a proportion as a relationship between two ratios. Grade seven students solve problems focused on proportional relationships and represent them using equations, tables, graphs, and diagrams. In grade eight, students extend all of these concepts and skills to understand linear functions in multiple representations and use them to solve real-world problems.

Ratios and Proportional Reasoning	
Learning Outcome	Students use ratios and reasoning to compare two quantities and understand unit rate. Students use ratios and unit rates to model and solve real-world problems.
Standard	6.RP.4: Solve real-world and other mathematical problems involving rates and ratios using models and strategies such as reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (E)
Evidence Statements	Academic Vocabulary
- Solve real-world problems involving ratios, unit rates, and multiplicative reasoning with models and strategies such as ratio tables, tape diagrams, or double number lines. - Justify solutions, either verbally or in writing, using models or strategies.	- Ratio - Part-to-part - Part-to-whole - Comparison (compare) - Equivalent ratios - Rate - Ratio
Clarification Statements	Common Misconceptions
This standard should be integrated with 6.RP.2 and 6.RP.3 as it provides the real-world problems necessary to teach the concepts of unit rates, rates, and ratios.	- Students may have difficulty determining if ratios represent a part-to-part relationship or a part-to-whole relationship. - Students may use additive reasoning when

- Students should continue to justify their thinking through modeling with ratio tables, tape diagrams, and double number lines. - This standard does add an additional concept of writing equations to represent the relationship between the two quantities being compared, however, this concept is also included in 6.RP.5.	multiplicative reasoning is required. - Students may have difficulty understanding how to plot the ratio pairs onto a coordinate plane. - Students may have difficulty identifying the whole in a part-to-part relationship (e.g., 3 kids to 2 parents, the whole is 5 family members) - Students may have difficulty or confusion with the order of quantities when writing a ratio.
Looking Back	Looking Ahead
This concept is not specifically addressed in the Indiana Academic Standards prior to this grade level.	7.RP.2: Use proportional relationships to solve ratio and percent problems with multiple operations (e.g., simple interest, tax, markups, markdowns, gratuities, conversions within and across measurement systems, and percent increase and decrease). (E)
Instructional Resources	
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-Sweet Tea Illustrative Mathematics-Hunger Games versus Divergent Illustrative Mathematics-Gianna's Job NRICH-Mixing Lemonade Mathematics Assessment Project-Using Proportional Reasoning Mathematics Assessment Project-Maximizing Profit: Selling Soup Mathematics Assessment Project-Sharing Costs Equitably: Traveling to School Dan Meyer-Nana's Paint Mix Up 3 Act Math Task Dan Meyer-Split Time 3 Act Math Task Dan Meyer-Leaky Faucet 3 Act Math Task Tools for Teachers-The Ratio Bakery (Login Instructions) Tools for Teachers-Use Ratios to Solve Real-World Problems (Login Instructions) Desmos-Paint Inside Mathematics-Snail Pace	
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.