Illinois State Board of Education

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Fact Sheet: Illinois Schools Implement New Math Standards
New state standards call for focus, coherence and rigor in mathematics instruction

As schools across the state implement the new Illinois Learning Standards, incorporating the Common Core, schools are leading math instruction that provides a deeper understanding of major concepts and emphasizes the ability to apply math to real life.

The new math standards, based on the Common Core, generate three major instructional shifts in **focus**, **coherence** and **rigor**. Adopted in 2010, these standards **focus** on the skills that students truly need to master at each grade level in order to succeed in subsequent grades. This means that there are fewer standards, but more teaching time for those standards that do remain. The standards are **coherent** both within a single grade and across grades. In other words, new concepts build upon previously learned concepts so that math topics are linked to one another. The standards also clearly progress in difficulty from one grade to the next.

Finally, the standards are **rigorous** because they support conceptual understanding, procedural skill and fluency, and application with equal intensity. Students with conceptual understanding see mathematics as something more than memorizing multiplication tables or using "tricks" to get a solution. They understand the actual mathematical process behind their work. With procedural skill and fluency, students perform math operations with speed and accuracy. Lastly, the Common Core requires that students apply their math knowledge to real world situations.

Illinois' transition to the standards incorporating the Common Core has resulted in clearer and more focused learning standards. Under the former state learning standards, adopted in 1997, schools could teach different math topics at different grade levels, so a fourth grade math class in one Illinois school district could cover significantly different material from another school district across the state. Now, the Illinois Learning Standards, based on the Common Core, ensure that all fourth-graders learn the same topics, although teachers within each district have the freedom to determine how to teach those topics to their students. The Common Core's consistency ensures that all Illinois students receive strong math instruction. It also eases the transition for students who move from one district or one state to another. Schools are expected to cover the same material in each grade level, making it less likely that new students fall behind or repeat material.

The following chart lists the major topics covered at each grade level from kindergarten through eighth grade under the Common Core math standards and illustrates the standards' **focus**, **coherence** and **rigor** (drawn from www.achievethecore.org):

Kindergarten

- Know number names and the count sequences
- Count to tell the number of objects
- Compare numbers
- Understand addition as putting together and adding to, and subtraction as taking apart and taking from
- Work with numbers 11-19 to gain foundations for place value

Grade 1

- Represent and solve problems involving addition and subtraction
- Understand and apply properties of operations and the relationship between addition and subtraction
- Add and subtract within 20
- Work with addition and subtraction equations
- Extend the counting sequence
- Understand place value
- Use place value understanding and properties to add and subtract
- Measure lengths indirectly and by iterating length units

Grade 2

- Represent and solve problems involving addition and subtraction
- Add and subtract within 20
- Understand place value
- Use place value understanding and properties of operations to add and subtract
- Measure and estimate lengths in standard units
- Relate addition and subtraction to length
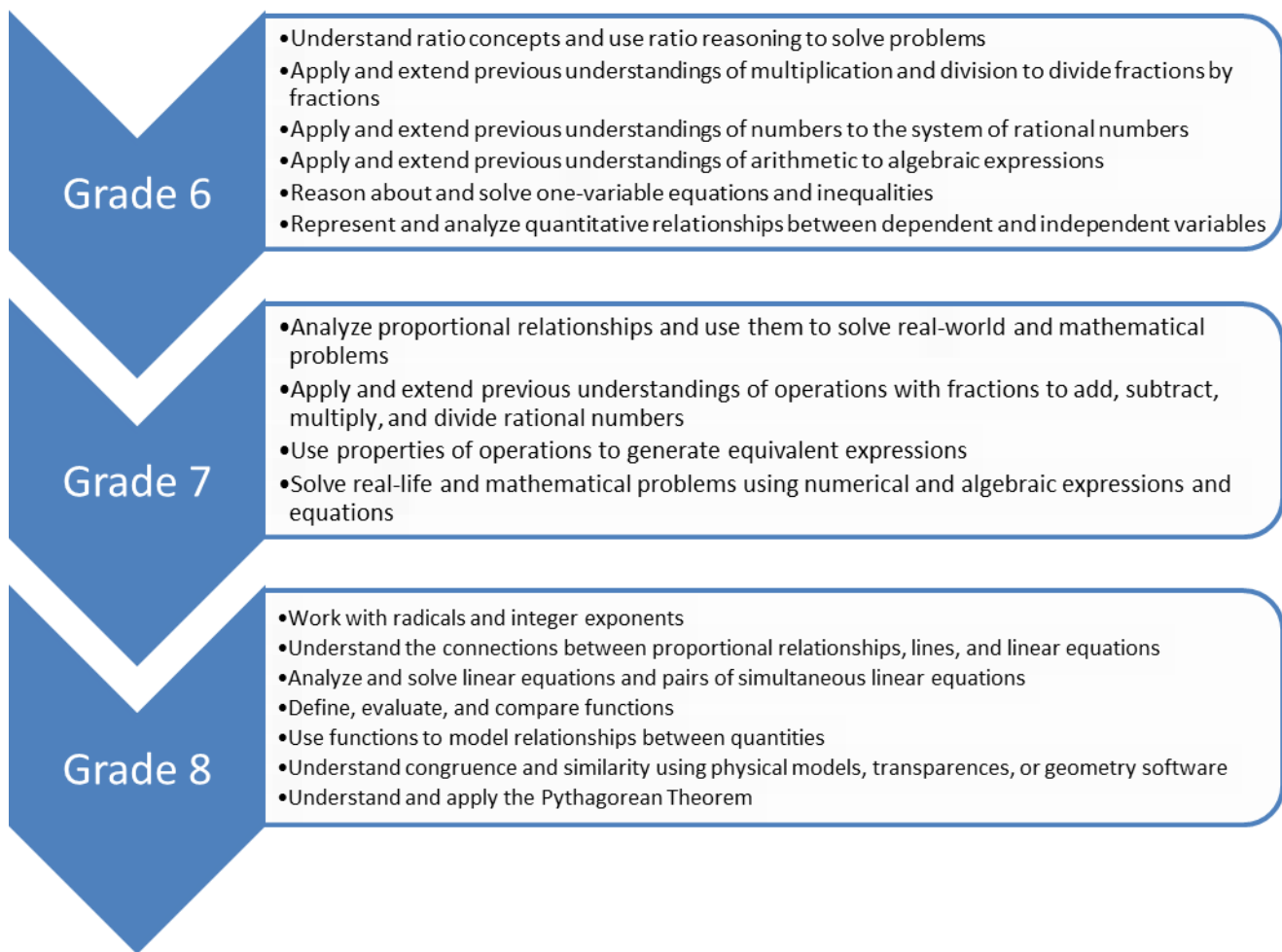
Grade 3

- Represent and solve problems involving multiplication and division
- Understand properties of multiplication and the relationship between multiplication and division
- Multiply and divide within 100
- Solve problems involving the four operations, and identify and explain patterns in arithmetic
- Develop understanding of fractions as numbers
- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects
- Understand concepts of area and relate area to multiplication and addition

Grade 4

- Use the four operations with whole numbers to solve problems
- Generalize place value understanding for multi-digit whole numbers
- Use place value understanding and properties of operations to perform multi-digit arithmetic
- Extend understanding of fraction equivalence and ordering
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers
- Understand decimal notation for fractions, and compare decimal fractions

Grade 5

- Understand the place value system
- Perform operations with multi-digit whole numbers and with decimals to hundredths
- Use equivalent fractions as a strategy to add and subtract fractions
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions
- Understand concepts of volume and relate volume to multiplication and addition

Grade 6
- Understand ratio concepts and use ratio reasoning to solve problems
- Apply and extend previous understandings of multiplication and division to divide fractions by fractions
- Apply and extend previous understandings of numbers to the system of rational numbers
- Apply and extend previous understandings of arithmetic to algebraic expressions
- Reason about and solve one-variable equations and inequalities
- Represent and analyze quantitative relationships between dependent and independent variables

Grade 7
- Analyze proportional relationships and use them to solve real-world and mathematical problems
- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers
- Use properties of operations to generate equivalent expressions
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations

Grade 8
- Work with radicals and integer exponents
- Understand the connections between proportional relationships, lines, and linear equations
- Analyze and solve linear equations and pairs of simultaneous linear equations
- Define, evaluate, and compare functions
- Use functions to model relationships between quantities
- Understand congruence and similarity using physical models, transparences, or geometry software
- Understand and apply the Pythagorean Theorem

This year's questions on the Illinois Standards Achievement Test (ISAT) will be 100 percent aligned to the new standards, based on the Common Core, in order to provide meaningful feedback for teachers, students and families about K-8 student progress in mathematics. For the 2014-15 school year, Illinois will debut new online assessments known as the Partnership for Assessment of Readiness for College and Careers, or PARCC. The PARCC was specifically designed to work in concert with the Common Core math standards. For more information about PARCC, please visit http://www.isbe.net/assessment/pdfs/parcc/parcc-fact-sheet-0813.pdf.

For those interested in learning more about the Common Core math standards, the following websites offer information and additional resources to aid in implementation:

- **Common Core State Standards Initiative**
  (http://www.corestandards.org/Math)

- **Illinois Council of Teachers of Mathematics**
  (http://ictm.org/CommonCore.htm)

- **Illinois State Board of Education**
  (http://www.isbe.net/common_core/htmls/math-models.htm)

- **Student Achievement Partners** (http://www.achievethecore.org/dashboard/300/search/1/2/0/1/2/3/4/5/6/7/8/9/10/11/12)

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