

■ Math in 6<sup>th</sup> grade focuses on developing understanding and proficiency with fractions and considering how fractions are used in different ways (e.g., percentages, decimals, probabilities). Based on national curriculum recommendations and reflecting Ohio Academic Content Standards, the following describes some of the central mathematical skills and understandings that students should acquire by the end of sixth grade.

## ■ Number and Operations

### Fractions

1. Write a decimal as a fraction in the form  $\frac{a}{b}$ , where  $b \neq 0$ , and vice versa (e.g., 3.02 is the same as  $\frac{302}{100}$ , and  $\frac{3}{4}$  is the same as the decimal 0.75)
2. Multiply and divide any two fractions, including mixed numbers (e.g.,  $1\frac{1}{2} \div \frac{3}{4} = 2$ ;  $\frac{5}{6} \times 2\frac{1}{2} = 2\frac{1}{12}$ )
3. Add, subtract, multiply, and divide integers between 10 and -10 and locate them on a number line (e.g.,  $-4 + -10 = -14$ ;  $-3 \times 4 = -12$ )
4. Solve problems involving fractions, in particular, problems involving decimals and percentages
5. Solve for unknowns in equations that involve fractions (e.g.,  $\frac{1}{4} \div \square = 1$  and  $\frac{3}{4} \div \square = \frac{1}{4}$ )

## ■ Algebra

### Expressions and Equations

6. Use symbols to write math expressions, combine like terms, and evaluate expressions for given numbers (e.g.,  $2x + 3 + 5x + 1$  simplifies to  $7x + 4$ , for  $x = 2$ ,  $7x + 4 = 18$ )
7. Represent simple relationships between quantities using words, equations, tables, and graphs

### Linear Equations

8. Solve problems involving rates, such as speed of a car (e.g., If a car averages 50 miles per hour how far will it go in  $3\frac{1}{2}$  hours?)
9. Solve equations of the form  $ax + b = c$  where  $a$ ,  $b$ , and  $c$  are positive whole numbers less than 20 (e.g., for the equation  $3x + 8 = 14$ , the solution is  $x = 2$ )
10. Solve problems involving linear relationships; graph the relationship, write an equation and use the graph and equation to answer questions (e.g., Given “c” chairs, each with 4 legs, the number of legs is  $4c$ . If you have 5 chairs, how many legs do you have? If you have 12 legs, how many chairs do you have?)

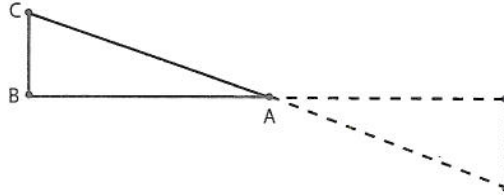
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## Mathematics — Grade 6 (cont.)

### ■ Geometry

#### Basic Properties

11. Understand the concept of congruence with respect to angles and polygons and how flipping, rotating, and sliding these relate to congruence (e.g., If you rotate a triangle 180 degrees about point A, the triangle will be congruent to the original triangle and in a different position)



12. Understand and apply relationships among lines, angles, and triangles (e.g., the sum of the angles in a triangle is  $180^\circ$ )

### ■ Measurement

#### Volume and Surface Area

13. Find the volume and surface area of cubes and rectangular prisms
14. Convert between basic units of measurement within a single measurement system (e.g., square feet to square yards)

### ■ Data and Probability

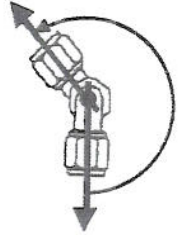
#### Understand Probability

15. Understand that probabilities are fractions between 0 and 1 and can be represented in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers, or in decimal form or as a percentage
16. Know the probability of an event is the ratio of the number of desired cases divided by the number of possible cases (assuming all cases are equally likely); a probability of "0" means an event will not happen, and a probability of "1" means an event will occur



## Glossary — Grade 6

- **Angle** – (1) two rays sharing a common endpoint, (2) the turn about a point

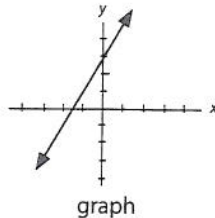


This is an example of a  $220^\circ$  angle of rotation; measured counter-clockwise.

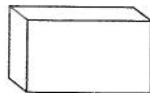
- **Congruent** – exactly the same shape and size
- **Expression** – a sequence containing numbers, symbols, and operations that can be used to represent a quantity (e.g.,  $3x + 5$ )
- **Equation** – a sentence where two mathematical expressions are equal (e.g.,  $2x + 6 = 20$  or  $4x + 4 = x + 16$ )
- **Integers** – whole numbers and their opposites (e.g.,  $\dots -3, -2, -1, 0, 1, 2, 3, \dots$ )
- **Linear Equations** – relationships between two quantities whose graph is a line that can be written in the form  $y = ax + b$  (e.g., graph of  $y = 2x + 3$  is a line)

table

x	y
0	3
1	5
2	7



- **Rectangular Prism** – a three-dimensional figure with six faces (sides) that are all rectangles



Rectangular Prism

## Tips and Activities for Parents

- Play games with your child such as checkers, board games, chess and increasingly complex card games. All involve problem solving and logic, and all are based on mathematics.
- Take your child to the grocery store for comparison shopping. Ask questions such as “Are 3 oranges for \$.79 or a dozen oranges for \$3.19 the better buy?”
- Help your child find the sales tax. Have your child select items from a store, sales ad in the newspaper or a catalog book. Use the sales tax rate to find the total cost of items if purchased.
- When eating out, have your child figure how much to leave for a tip.

## Internet Resources for Sixth Grade Math

Sorted by grade level, this site provides practice in basic math skills using unlimited interactive practice, explanations and examples, and challenge games. Hundreds of Pages.  
[www.aaamath.com/grade6.htm](http://www.aaamath.com/grade6.htm)

Elementary mathematics links for grades 4-6 mathematics practice, including Fill and Pour · The Fruit Game · Mastermind · Math Maven’s Mysteries · Math Teaser Challenge · Number Sense.  
[www.sowashco.k12.mn.us/virtualmedia/elementary/math/4-6math.htm](http://www.sowashco.k12.mn.us/virtualmedia/elementary/math/4-6math.htm)

Interested in mathematics, check out these mathematics pages.  
[www.kidport.com/Grade6/Math/MathIndex.htm](http://www.kidport.com/Grade6/Math/MathIndex.htm)

An assortment of math brain activities - 25 Board Games to teach skills.  
[www.k111.k12.il.us/King/math.htm](http://www.k111.k12.il.us/King/math.htm)

Visit “Mathematics Counts & Science Matters” at [www.promse.msu.edu](http://www.promse.msu.edu)

Local Partner: SMART Consortium [www.smartconsortium.org](http://www.smartconsortium.org)

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“Mathematics Counts & Science Matters” provides parents of children in grades K-8 with helpful resources they can use to support their child’s math learning. The content of this guide is based on grade-level recommendations from the National Council of Teachers of Mathematics, the National Mathematics Panel, and PROM/SE: Promoting Rigorous Outcomes in Mathematics and Science Education. These recommendations may be more advanced than state guidelines. Mathematics Counts & Science Matters is developed by Michigan State University’s PROM/SE (Promoting Rigorous Outcomes in Mathematics and Science Education).  
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