Alabama Mathematics

Grade 6

Adopted 2019

Student Mathematical Practices

1. **Make sense of problems and persevere in solving them.** MP.1
2. **Reason abstractly and quantitatively.** MP.2
3. **Construct viable arguments and critique the reasoning of others.** MP.3
4. **Model with mathematics.** MP.4
5. **Use appropriate tools strategically.** MP.5
6. **Attend to precision.** MP.6
7. **Look for and make use of structure.** MP.7
8. **Look for and express regularity in repeated reasoning.** MP.8

Proportional Reasoning

A. **Develop an understanding of ratio concepts and use reasoning about ratios to solve problems.** 6.PR.A

1. Use appropriate notations [a/b, a to b, a:b] to represent a proportional relationship between quantities and use ratio language to describe the relationship between quantities. 6.PR.A.1
2. Use unit rates to represent and describe ratio relationships. 6.PR.A.2
3. Use ratio and rate reasoning to solve mathematical and real-world problems (including but not limited to percent, measurement conversion, and equivalent ratios) using a variety of models, including tables of equivalent ratios, tape diagrams, double number lines, and equations. 6.PR.A.3

Number Systems and Operations

A. **Use prior knowledge of multiplication and division to divide fractions.** 6.NS.A

4. Interpret and compute quotients of fractions using visual models and equations to represent problems. 6.NS.A.4

a. Use quotients of fractions to analyze and solve problems. 6.NS.A.4.A

B. Compute multi-digit numbers fluently and determine common factors and multiples. 6.NS.B

5. Fluently divide multi-digit whole numbers using a standard algorithm to solve real-world and mathematical problems. 6.NS.B.5
6. Add, subtract, multiply, and divide decimals using a standard algorithm. 6.NS.B.6
7. Use the distributive property to express the sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factor. 6.NS.B.7
8. Find the greatest common factor (GCF) and least common multiple (LCM) of two or more whole numbers. 6.NS.B.8
    a. Use factors and multiples to determine prime factorization. 6.NS.B.8.A

C. Apply knowledge of the number system to represent and use rational numbers in a variety of forms. 6.NS.C

9. Use signed numbers to describe quantities that have opposite directions or values and to represent quantities in real-world contexts. 6.NS.C.9
10. Locate integers and other rational numbers on a horizontal or vertical line diagram. 6.NS.C.10
    a. Define opposites as numbers located on opposite sides of 0 and the same distance from 0 on a number line. 6.NS.C.10.A
    b. Use rational numbers in real-world and mathematical situations, explaining the meaning of 0 in each situation. 6.NS.C.10.B
11. Find the position of pairs of integers and other rational numbers on the coordinate plane. 6.NS.C.11
    a. Identify quadrant locations of ordered pairs on the coordinate plane based on the signs of the x and y coordinates. 6.NS.C.11.A
    b. Identify (a,b) and (a,-b) as reflections across the x-axis. 6.NS.C.11.B
    c. Identify (a,b) and (-a,b) as reflections across the y-axis. 6.NS.C.11.C
    d. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane, including finding distances between points with the same first or second coordinate. 6.NS.C.11.D
12. Explain the meaning of absolute value and determine the absolute value of rational numbers in real-world contexts 6.NS.C.12
13. Compare and order rational numbers and absolute value of rational numbers with and without a number line in order to solve real-world and mathematical problems. 6.NS.C.13

Algebra and Functions

A. Apply knowledge of arithmetic to read, write, and evaluate algebraic expressions. 6.AF.A

14. Write, evaluate, and compare expressions involving whole number exponents. 6.AF.A.14
15. Write, read, and evaluate expressions in which letters represent numbers in real-world contexts. 6.AF.A.15
    a. Interpret a variable as an unknown value for any number in a specified set, depending on the context. 6.AF.A.15.A
    b. Write expressions to represent verbal statements and real-world scenarios. 6.AF.A.15.B
    c. Identify parts of an expression using mathematical terms such as sum, term, product, factor, quotient, and coefficient. 6.AF.A.15.C
    d. Evaluate expressions (which may include absolute value and whole number exponents) with respect to order of operations. 6.AF.A.15.D
16. Generate equivalent algebraic expressions using the properties of operations, including inverse, identity, commutative, associative, and distributive. 6.AF.A.16
17. Determine whether two expressions are equivalent and justify the reasoning. 6.AF.A.17

B. Use equations and inequalities to represent and solve real-world or mathematical problems. 6.AF.B

18. Determine whether a value is a solution to an equation or inequality by using substitution to conclude whether a given value makes the equation or inequality true. 6.AF.B.18
19. Write and solve an equation in the form of x + p = q or px = q for cases in which p, q, and x are all non-negative rational numbers to solve real-world and mathematical problems. 6.AF.B.19
    a. Interpret the solution of an equation in the context of the problem. 6.AF.B.19.A
20. Write and solve inequalities in the form of x > c, x < c, x ≥ c, or x ≤ c to represent a constraint or condition in a real-world or mathematical problem. 6.AF.B.20
    a. Interpret the solution of an inequality in the context of a problem. 6.AF.B.20.A
    b. Represent the solutions of inequalities on a number line and explain that the solution set may contain infinitely many solutions. 6.AF.B.20.B

C. Identify and analyze relationships between independent and dependent variables. 6.AF.C

C21. Identify, represent, and analyze two quantities that change in relationship to one another in real-world or mathematical situations. 6.AF.C21

a. Use tables, graphs, and equations to represent the relationship between independent and dependent variables. 6.AF.C21.A

Data Analysis, Statistics, and Probability

A. Use real-world and mathematical problems to analyze data and demonstrate an understanding of statistical variability and measures of center. 6.DSP.A

22. Write examples and non-examples of statistical questions, explaining that a statistical question anticipates variability in the data related to the question. 6.DSP.A.22

23. Calculate, interpret, and compare measures of center (mean, median, mode) and variability (range and interquartile range) in real-world data sets. 6.DSP.A.23

a. Determine which measure of center best represents a real-world data set. 6.DSP.A.23.A

b. Interpret the measures of center and variability in the context of a problem. 6.DSP.A.23.B

24. Represent numerical data graphically, using dot plots, line plots, histograms, stem and leaf plots, and box plots. 6.DSP.A.24

a. Analyze the graphical representation of data by describing the center, spread, shape (including approximately symmetric or skewed), and unusual features (including gaps, peaks, clusters, and extreme values). 6.DSP.A.24.A

b. Use graphical representations of real-world data to describe the context from which they were collected. 6.DSP.A.24.B

Geometry and Measurement

A. Graph polygons in the coordinate plane to solve real-world and mathematical problems. 6.GM.A

25. Graph polygons in the coordinate plane given coordinates of the vertices to solve real-world and mathematical problems. 6.GM.A.25

a. Determine missing vertices of a rectangle with the same x-coordinate or the same y-coordinate when graphed in the coordinate plane. 6.GM.A.25.A

b. Use coordinates to find the length of a side between points having the same x-coordinate or the same y-coordinate. 6.GM.A.25.B

c. Calculate perimeter and area of a polygon graphed in the coordinate plane (limiting to polygons in which consecutive vertices have the same x-coordinate or the same y-coordinate). 6.GM.A.25.C

B. Solve real-world and mathematical problems to determine area, surface area, and volume. 6.GM.B

26. Calculate the area of triangles, special quadrilaterals, and other polygons by composing and decomposing them into known shapes. 6.GM.B.26
    a. Apply the techniques of composing and decomposing polygons to find area in the context of solving real-world and mathematical problems. 6.GM.B.26.A
27. Determine the surface area of three-dimensional figures by representing them with nets composed of rectangles and triangles to solve real-world and mathematical problems. 6.GM.B.27
28. Apply previous understanding of volume of right rectangular prisms to those with fractional edge lengths to solve real-world and mathematical problems. 6.GM.B.28
    a. Use models (cubes or drawings) and the volume formulas (V = lwh and V = Bh) to find and compare volumes of right rectangular prisms. 6.GM.B.28.A