Oregon Mathematics

Grade 8

Adopted 2021

Mathematical Practice Standards

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

Grade 8

Algebraic Reasoning: Expressions and Equations

A. Expressions and Equations Work with radicals and integer exponents. 8.AEE.A

1. Apply the properties of integer exponents using powers of 10 to generate equivalent numerical expressions. 8.AEE.A.1
2. Represent solutions to equations using square root and cube root symbols. 8.AEE.A.2
3. Estimate very large or very small quantities using scientific notation with a single digit times an integer power of ten. 8.AEE.A.3
4. Perform operations with numbers expressed in scientific notation. 8.AEE.A.4

B. Understand the connections between proportional relationships, lines, and linear equations. 8.AEE.B

5. Graph proportional relationships in authentic contexts. Interpret the unit rate as the slope of the graph, and compare two different proportional relationships represented in different ways. 8.AEE.B.5
6. Write the equation for a line in slope intercept form y = mx + b, where m and b are rational numbers, and explain in context why the slope m is the same between any two distinct points. 8.AEE.B.6

C. Analyze and solve linear equations and pairs of simultaneous linear equations. 8.AEE.C

7. Solve linear equations with one variable including equations with rational number coefficients, with the variable on both sides, or whose solutions require using the distributive property and/or combining like terms. 8.AEE.C.7
8. Find, analyze, and interpret solutions to pairs of simultaneous linear equations using graphs or tables. 8.AEE.C.8

Algebraic Reasoning: Functions

A. Define, evaluate, and compare functions. 8.AFN.A

1. Understand in authentic contexts, that the graph of a function is the set of ordered pairs consisting of an input and a corresponding output. 8.AFN.A.1
2. Compare the properties of two functions represented algebraically, graphically, numerically in tables, or verbally by description. 8.AFN.A.2
3. Understand and identify linear functions, whose graph is a straight line, and identify examples of functions that are not linear. 8.AFN.A.3

B. Use functions to model relationships between quantities. 8.AFN.B

4. Construct a function to model a linear relationship in authentic contexts between two quantities. 8.AFN.B.4
5. Describe qualitatively the functional relationship between two quantities in authentic contexts by analyzing a graph. 8.AFN.B.5

Numeric Reasoning: Number Systems

A. Know that there are numbers that are not rational, and approximate them by rational numbers. 8.NS.A

   1. Know that real numbers that are not rational are called irrational. 8.NS.A.1
   2. Use rational approximations of irrational numbers to compare size and locate on a number line. 8.NS.A.2

Geometric Reasoning and Measurement

A. Understand congruence and similarity using physical models, transparencies, or geometry software. 8.GM.A

   1. Verify experimentally the properties of rotations, reflections, and translations. 8.GM.A.1
   2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. 8.GM.A.2
   3. Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates. 8.GM.A.3
   4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and/or dilations. 8.GM.A.4
   5. Use informal arguments to establish facts about interior and exterior angles of triangles and angles formed by parallel lines cut with a transversal. 8.GM.A.5

B. Understand and apply the Pythagorean Theorem. 8.GM.B

   6. Distinguish between applications of the Pythagorean Theorem and its Converse in authentic contexts. 8.GM.B.6
   7. Apply the Pythagorean Theorem in authentic contexts to determine unknown side lengths in right triangles. 8.GM.B.7
   8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. 8.GM.B.8

C. Solve mathematical problems in authentic contexts involving volume of cylinders, cones, and spheres. 8.GM.C

   9. Choose and use the appropriate formula for the volume of cones, cylinders, and spheres to solve problems in authentic contexts. 8.GM.C.9

Data Reasoning

A. Formulate Statistical Investigative Questions. `8.DR.A`

1. Formulate statistical investigative questions to articulate research topics and uncover patterns of association seen in bivariate categorical data. `8.DR.A.1`

B. Collect and Consider Data. `8.DR.B`

2. Collect or consider data using surveys and measurements to capture patterns of association, and critically analyze data collection methods. `8.DR.B.2`

C. Analyze, summarize, and describe data. `8.DR.C`

3. Analyze patterns of association between two quantitative or categorical variables and reason about distributions to compare groups. `8.DR.C.3`

D. Interpret data and answer investigative questions. `8.DR.D`

4. Interpret scatter plots for bivariate quantitative data to investigate patterns of association between two quantities to answer investigative questions. `8.DR.D.4`