

## Standards for Mathematical Practice

The eight standards for mathematical practice describe the “know-how” or habits of mind that we seek to develop in students. These practices define important methods and skills that students need to be mathematically proficient.

- 1. Make sense of problems and persevere in solving them.**  
*Students seek the meaning of a problem and looks for efficient ways to represent and solve it. They may check their thinking by asking themselves, “What is the most efficient way to solve this?”, “Does this make sense?”, and “Can I solve the problem in a different way?”.*
- 2. Reason abstractly and quantitatively.**  
*Students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities.*
- 3. Construct viable arguments and critique the reasoning of others.**  
*Students construct arguments using verbal or written explanations. They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students.*
- 4. Model with mathematics.**  
*Students model problem situations symbolically, graphically, tabularly, and contextually. Students need many opportunities to connect and explain the connections between the different representations.*
- 5. Use appropriate tools strategically.**  
*Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful.*
- 6. Attend to precision.**  
*Students use clear and precise language in their mathematical discussions with others and in their own reasoning.*
- 7. Look for and make use of structures.**  
*Students routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables recognizing both the additive and multiplicative properties.*
- 8. Look for and express regularity in repeated reasoning.**  
*Students’ use of repeated reasoning to understand algorithms and make generalizations about patterns.*

# Portland Public Schools



## Great Expectations: Standards and Practices for Compacted Year 1

### What are the Common Core State Standards?

For over a decade, research studies of mathematics education in high performing countries have concluded that mathematics instruction in the United States must become more focused and coherent in order to improve mathematics achievement. Historically, math standards have varied from state to state. In June of 2009, the development of the **Common Core State Standards** (CCSS) began. Oregon, along with over 45 other states, has adopted the CCSS and started assessing them in the 2014-15 school year.

The CCSS provide a clear and consistent understanding of what students are expected to learn in K-12 math. Common standards will help ensure that students are receiving a high quality education consistently, from school to school, and state to state. CCSS for mathematics includes two types of standards: one for **mathematical practices** (how students engage, apply, and extend their understandings of mathematical concepts) and one for **mathematical content** (what mathematical skills and procedures students are expected to know).

This guide outlines the mathematical content and practice standards that are taught in Compacted Year 1. The math content will focus on the following critical areas in Math 7: extending their understanding of concepts of ratio and rate to solve problems; extending the understanding of the four operations to all rational numbers (which include negative numbers) and writing, interpreting, and solving equations that represent real world problems; reasoning about and solving problems involving geometric relationships in two- and three-dimensional figures; and building on previous work with single data distributions to compare two data distributions as well as using random sampling to generate data sets and make inferences about populations. From the first half of Math 8: solving linear equations; comparing proportional relationships; modeling and comparing functions; rotating, reflecting, translating, dilating, and determining congruency between figures; solving problems involving angles; and investigating patterns in bivariate data. The eight mathematical practices define the ways that students engage with mathematics.

# Compacted Year 1 Learning Targets

These learning targets encompass what a student should be proficient in by the end of Compacted Year 1. Mastery of this content will ensure student success at the next level.

## Ratios and Proportional Relationships

(Example: After eating at your favorite restaurant, you know that the bill before tax is \$52.60 and that the sales tax rate is 8%. You decide to leave a 20% tip for the waiter based on the pre-tax amount. How much should you leave for the waiter? How much will the total be, including tax and tip? Show your work to support your answers.)

- **7.RP.1** - I can solve problems with and compare unit rates from tables, graphs, equations, and descriptions.
- **7.RP.2** - I can solve multi-step ratio and percent problems.

## The Number System

(Example: The three seventh grade classes at Division Middle School collected the most boxtops for a school fundraiser, and so they won a \$600 prize to share among them. Mr. Cortez's class collected 3,760 box tops, Mrs. O'Brien's class collected 2,301, and Mr. Palmier's class collected 1,855. How should they divide the money so that each class gets the same fraction of the prize money as the fraction of the box tops that they collected?)

- **7.NS.1** - I can add, subtract, multiply, and divide rational numbers.

## Expressions and Equations

(Example: At Sammy's birthday party, there were 200 tamales. He ate 1.25 tamales every hour. How many tamales are left after 12 hours?)

- **7.EE.1** - I can simplify, expand, and create equivalent expressions.
- **7.EE.2** - I can write and solve one-variable equations.
- **7.EE.3** - I can write and solve one-variable inequalities.

## Geometry

(Example: Khadijah has an 80:1 scale drawing of the floor plan of her house. On the floor plan, the dimensions of her rectangular living room are  $1\frac{1}{8}$  inches by  $2\frac{1}{2}$  inches. What is the area of her real living room in square feet?)

- **7.G.1** - I can compute actual lengths and areas from a scale drawing and create scale drawings.
- **7.G.2** - I can construct and describe triangles from three measures of angles or sides.
- **7.G.3** - I can describe the relationships between parts of a circle and apply them to find area and circumference.
- **7.G.4** - I can solve simple equations involving angle measure.
- **7.G.5** - I can solve real world problems involving area, volume, and surface area of 2-D and 3-D objects.

## Statistics and Probability

(Example: A container contains 2 gray, 1 white, and 4 black marbles. Without looking, if you choose a marble from the container, will the probability be closer to 0 or 1 that you will select a white marble? A gray marble? A black marble? Justify each of your predictions.)

- **7.SP.1** - I can use random sampling to compare and draw inferences about populations.
- **7.SP.2** - I can analyze chance events with probability models.

## Expressions and Equations

(Example: Solve and identify how many solutions each problem has:

a.  $5x + 8 = 5x + 3$    b.  $9x = 8 + 5x$    c.  $6x + 3 + 9 = 6x + 12$ )

- **8.EE.4** - I can compare proportional relationships by graphing, finding slope, and writing an equation.
- **8.EE.5** - I can solve linear equations.
- **8.EE.6** - I can solve a system graphically and algebraically.

## Functions

(Example: Is  $-4x + y = 7$  a function? Describe the properties that either make it a function or not.)

- **8.F.1** - I can identify, model, and compare functions.

## Geometry

(Example: Are the following three side lengths a right triangle? Prove your answer.

a. 3, 4, 5   b. 6, 8, 15)

- **8.G.1** - I can rotate, reflect, translate, and dilate figures.
- **8.G.2** - I can describe how two figures are similar or congruent using transformations.
- **8.G.3** - I can solve problems involving angles.

## Statistics and Probability

(Example: Following is 10 days of data which shows the sale of apples and mangoes. Describe the association between the apple and mango sales.)

Days	1	2	3	4	5	6	7	8	9	10
Apple	62	49	81	26	45	55	16	74	97	34
Mango	36	44	49	37	26	11	76	83	64	81

- **8.SP.1** - I can construct a scatter plot and use it to interpret patterns in data.
- **8.SP.2** - I can construct a two-way table to interpret its relative frequencies.