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 wold 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 6th Grade Mathematics

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 6th Grade Math. The math content will focus on the following critical areas: using concepts of ratio and rate to solve problems; completing the understanding of division of fractions and extending the notion of number to the system of rational numbers (which include negative numbers); writing, interpreting, and using expressions and equations; and developing an understanding of statistical thinking. The eight mathematical practices define the ways that students engage with mathematics.

Sixth Grade Math Learning Targets

These learning targets encompass what a student should be proficient in by the end of Math 6. Mastery of this content will ensure student success at the next level.

Ratios and Proportional Relationships

(Example: At Safeway, bananas are 5 for $1.29. At WinCo, bananas are 12 for $2.25. Compare the unit rate of bananas at each store to determine which store offers the better deal on bananas.)

- **6.RP.1** - I can compare and solve problems about ratios.
- **6.RP.2** - I can model and solve unit rate problems.

The Number System

(Example: What is the greatest common factor (GCF) of 24 and 36? How can you use factor lists or the prime factorizations to find the GCF?)

- **6.NS.1** - I can multiply and divide fractions.
- **6.NS.2** - I can add, subtract, multiply, and divide with multi-digit numbers.
- **6.NS.3** - I can add, subtract, mulitiply, and divide with decimals.
- **6.NS.4** - I can position positive and negative numbers on a number line.

Expressions and Equations

(Example: Jonas spent more than $50 at an amusement park. Write an inequality to represent the amount of money Jonas spent. What are some possible amounts of money Jonas could have spent? Represent the situation on a number line.)

- **6.EE.1** - I can write and evaluate algebraic expressions.
- **6.EE.2** - I can write and determine equivalent expressions.
- **6.EE.3** - I can write and solve equations.
- **6.EE.4** - I can write and solve inequalities.
- **6.EE.5** - I can analyze a graph and identify the relationship between the variables.

Geometry

(Example: The batter for your banana bread recipe fills a 8.5in by 11in by 1.75in pan to the very top, but spills over the side when it bakes. Can you use a 9in by 9in by 3in pan if you need about an inch between the op of the batter and the rim of the pan?)

- **6.G.1** - I can solve problems involving area of complex shapes.
- **6.G.2** - I can find volume of rectangular prisms.
- **6.G.3** - I can draw polygons on a coordinate plane and determine the side lengths.
- **6.G.4** - I can represent and determine the surface area of a 3-D figure using a net.
- **6.G.5** - I can solve problems involving area and circumference of a circle.

Statistics and Probability

(Example: Students went on a picnic. They recorded a list of the number of animals that were in each pen. The result was 12, 16, 10, 19, 17, 10, 10, 11, 11, 11, 12, 12, 12, 11, 12, 13, 12, 14, 15, and 18. Create a data display. What are some observations that can be made from the data display?)

- **6.SP.1** - I can identify a statistical question.
- **6.SP.2** - I can represent and interpret statistical data.