

# Plainfield Public Schools

Plainfield Secondary Math

Sequence & Pacing Guide

New Jersey Student Learning Standard



**\*\*REVISED**

PLAINFIELD PUBLIC SCHOOLS

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## Standards for Mathematical Practice

Mathematical Practice	Explanation
<b>Mathematical Practice 1:</b> Make sense of problems and persevere in solving them	In grade 6, students solve problems involving ratios and rates and discuss how they solved the problems. Students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, “What is the most efficient way to solve the problem?”, “Does this make sense?”, and “Can I solve the problem in a different way?”.
<b>Mathematical Practice 2:</b> Reason abstractly and quantitatively.	In grade 6, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.
<b>Mathematical Practice 3:</b> Construct viable arguments and critique the reasoning of others.	In grade 6, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like —How did you get that?  , —Why is that true?   —Does that always work?   They explain their thinking to others and respond to others’ thinking.
<b>Mathematical Practice 4:</b> Model with mathematics.	In grade 6, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students explore covariance and represent two quantities simultaneously. They use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences, make comparisons and formulate predictions. Students use experiments or simulations to generate data sets and create probability models. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.
<b>Mathematical Practice 5:</b> 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. For instance, students in grade 6 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Additionally, students might use physical objects or applets to construct nets and calculate the surface area of three-dimensional figures
<b>Standard for Mathematical Practice 6:</b> Attend to precision.	In grade 6, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to rates, ratios, geometric figures, data displays, and components of expressions, equations or inequalities

<p><b>Standard for Mathematical Practice 7:</b> Look for and make use of structure</p>	<p>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. Students apply properties to generate equivalent expressions (i.e. <math>6 + 2x = 2(3 + x)</math> by distributive property) and solve equations (i.e. <math>2c + 3 = 15</math>, <math>2c = 12</math> by subtraction property of equality; <math>c=6</math> by division property of equality). Students compose and decompose two- and three-dimensional figures to solve real world problems involving area and volume .</p>
<p><b>Standard for Mathematical Practice 8:</b> Look for and express regularity in repeated reasoning.</p>	<p>In grade 6, students use repeated reasoning to understand algorithms and make generalizations about patterns. During multiple opportunities to solve and model problems, they may notice that <math>a/b \div c/d = ad/bc</math> and construct other examples and models that confirm their generalization. Students connect place value and their prior work with operations to understand algorithms to fluently divide multi-digit numbers and perform all operations with multi-digit decimals. Students informally begin to make connections between covariance, rates, and representations showing the relationships between quantities.</p>

The Plainfield Secondary Math Curriculum is based on New Jersey Student Learning Standard. These standards are based on a philosophy of teaching and learning mathematics that is consistent with the current research and exemplary practices. Each unit is comprised of standards that are identified as major (▲), supporting (●) and/or additional content (■). Not all of the content in a given grade is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of the ideas, time needed to master or model, and their importance to future grade level. Major standards are purposefully placed in tested grades for ensuring time for formal instruction. The goal of the curriculum is to ensure all students possess the following:

- conceptual understanding—comprehension of mathematical concepts, operations, and relations
- procedural fluency—skill in carrying out procedures flexibly, accurately, efficiently, and appropriately
- strategic competence—ability to formulate, represent, and solve mathematical problems
- adaptive reasoning—capacity for logical thought, reflection, explanation, and justification
- productive disposition—habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy.

## Grade 6 Pacing Chart

Unit /Quarter 1		
# Days	Topics	Standards
10	<p><b>Number Sense</b></p> <ul style="list-style-type: none"> <li>Construct &amp; compute fraction models to represent quotients of fractions and use the relationship between multiplication and division to explain division of fractions.</li> <li>Solve real-world problems involving quotients of fractions and interpret the solutions in the context given.</li> <li>Fluently divide multi-digit numbers using the standard algorithms.</li> </ul>	<p>6.NS.1 ▲</p> <p>6.NS.2 ●</p> <p>6.NS.3 ●</p> <p>6.NS.B.4 ●</p>
25	<p><b>Rate &amp; Ratio</b></p> <ul style="list-style-type: none"> <li>Explain the relationship of two quantities in given ratio using ratio language</li> <li>Create and complete tables of equivalent ratios to solve real world and mathematical problems using ratio and rate reasoning that include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100.</li> <li>Use ratio and rate reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities</li> </ul>	<p>6.RP.A.1 ▲ 6.RP.A.2 ▲</p> <p>6.RP.A.3 ▲</p>

Unit/ Quarter 2		
Days	Topic	Standards
30	<p>Expressions</p> <ul style="list-style-type: none"> <li>• Write and evaluate numerical expressions involving whole number exponents</li> <li>• Use mathematical language to identify parts of an expression.</li> <li>• Write and evaluate algebraic expressions involving exponents (include evaluating formulas)</li> <li>• Apply properties of operations (factor, distribute, and combine like terms) to generate equivalent expressions and to identify when two expressions are equivalent.</li> <li>• Use variables to represent numbers and write expressions when solving real world or mathematical problems.</li> </ul> <p>Geometry</p> <ul style="list-style-type: none"> <li>• Find the volume of a right rectangular prism</li> <li>• Surface area</li> </ul>	<p>6.EE.A.1 ▲</p> <p>6.EE.A.2.A ▲</p> <p>6.EE.A.2.B ▲</p> <p>6.EE.A.2.C ▲</p> <p>6.EE.A.3 ▲</p> <p>6.EE.A.4 ▲</p> <p>6.EE.B.6 ▲</p> <p>6.G.A.2 ●</p> <p>6.G.A.4 ●</p>

### Quarter 3

# Days	Topics	Standards
15	<p><b>Equations</b></p> <ul style="list-style-type: none"> <li>• Use substitution to determine whether a given number makes an equation or inequality true</li> <li>• Solve real world problems by writing and solving equations</li> </ul>	<p>6.EE.B.5 ▲</p> <p>6.EE.B.7 ▲</p>
30	<p><b>Rational Numbers</b></p> <ul style="list-style-type: none"> <li>• Locate rational numbers and their opposites on horizontal and vertical number line;</li> <li>• Plot pairs of positive and negative rational numbers in the coordinate plane;</li> <li>• Use statements of inequality to determine relative positions of two rational numbers on a number line; write and explain statements of order for rational numbers in real-world contexts</li> <li>• Explain the meaning of absolute value of a rational number as distance from zero on the number line and as magnitude for a positive or negative quantity</li> <li>• Write an inequality of the form <math>x &gt; c</math> or <math>x &lt; c</math> to represent a constraint or condition in a real world or mathematical problem and represent them on a number line.</li> </ul> <p><b>Graphing &amp; Coordinate</b></p>	<p>6.NS.C.6. a ▲</p> <p>6. NS.C.6.b ▲</p> <p>6.NS.C.6.c ▲</p> <p>6.NS.C.7a ▲</p> <p>6.NS.C.7b ▲</p> <p>6.NS.C.7c ▲</p> <p>6.NS.C.7d ▲</p> <p>6.EE.B.8 ▲</p> <p>6.NS.C.8 ▲</p> <p>6.EE.C.9. ▲</p> <p>6.G.A.1 ●</p>

	<ul style="list-style-type: none"> <li>Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane</li> <li>Graph the relationship between the dependent and independent variables</li> <li>Draw polygons in the coordinate plane given coordinates for the vertices</li> <li>Find the area of right triangles, other triangles</li> </ul>	
<b>Unit / Quarter 4</b>		
<b>Days</b>	<b>Topics</b>	<b>Standards</b>
15	<b>Representing Data</b> <ul style="list-style-type: none"> <li>Distinguish questions that are statistical</li> <li>Display numerical data in plots on the number line (including dot plots, histograms, and box plots) and summarize in relation to their context.</li> <li>Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane</li> </ul>	6.SP.A.1  6.SP.A.2  6.SP.A.3  6.SP.A.4  6.NS.C.8 
20	<b>Calculating data</b> <ul style="list-style-type: none"> <li>Calculate, and interpret measures of center</li> <li>Use ratio and rate reasoning to convert measurement units</li> </ul>	6.RP.A.3a  6. RP.A.3b  6. RP.A.3c  6.SP.B.5  6.SP.B.5a  6.SP.B.5b  6.SP.B.5c  6.SP.B.5d 

		6. RP.A.3d ▲
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## Glossary

**Additional Content Standards:** Standards that are taught in addition to the context for supporting and focus standards, but do not require the same level of attention.

**Big Ideas:** The foundational understandings – main ideas, conclusions, or generalizations relative to the unit’s “unwrapped” concepts – that educators want their students to discover and state in their own words by the end of the unit of study. Big Ideas convey to students the benefit or value of learning the standards in focus that they are to remember long after instruction ends.

**Depth of Knowledge (DOK):** A four-level framework used to analyze the cognitive demand of a standard, assessment, or task.

- Level One – recall
- Level Two – skill/concept
- Level Three – strategic thinking
- Level Four – extended thinking

**Essential Questions:** Engaging, open-ended questions that educators use to spark student interest in learning the content of the unit about to commend. Even though plainly worded, they carry with them an underlying rigor. Responding to them in a way that demonstrates genuine understanding requires more than superficial thought. Along with the “unwrapped” concepts and skills from the Priority Standards, educators use the Essential Questions throughout the unit to sharply focus instruction and assessment.

**Focus Standards:** The most essential standards for students to master, the most critical outcomes of their learning experience. Focus Standards are "key learnings" that will prepare students for the next grade level.

**Supporting Standards:** Standards that support, connect to, and enhance the Focus Standards. They are taught within the context of the Focus Standards but do not receive the same degree of instruction and assessment emphasis.