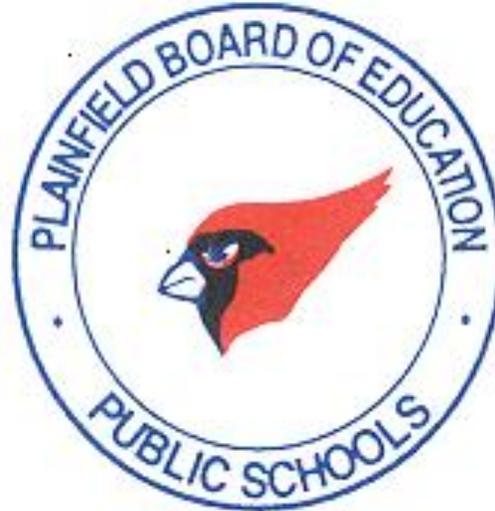


# Plainfield Public Schools

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 7, 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 7, 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 7, 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 7, students model problem situations symbolically, graphically, tabular, 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 7 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Students might use physical objects or applets to generate probability data and use graphing calculators or spreadsheets to manage and represent data in different forms.
<b>Standard for Mathematical Practice 6:</b> Attend to precision.	In grade 7, 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 define

	variables, specify units of measure, and label axes accurately. Students use appropriate terminology when referring to rates, ratios, probability models, geometric figures, data displays, and components of expressions, equations or inequalities
<b>Standard for Mathematical Practice 7:</b> Look for and make use of structure	Students routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables making connections between the constant of proportionality in a table with the slope of a graph. Students apply properties to generate equivalent expressions (i.e. $6 + 2x = 2(3 + x)$ by distributive property) and solve equations (i.e. $2c + 3 = 15$ , $2c = 12$ by subtraction property of equality; $c=6$ by division property of equality). Students compose and decompose two- and three-dimensional figures to solve real world problems involving scale drawings, surface area, and volume. Students examine tree diagrams or systematic lists to determine the sample space for compound events and verify that they have listed all possibilities.
<b>Standard for Mathematical Practice 8:</b> Look for and express regularity in repeated reasoning.	In grade 7, students use repeated reasoning to understand algorithms and make generalizations about patterns. During multiple opportunities to solve and model problems, they may notice that $a/b \div c/d = ad/bc$ and construct other examples and models that confirm their generalization. They extend their thinking to include complex fractions and rational numbers. Students formally begin to make connections between covariance, rates, and representations showing the relationships between quantities. They create, explain, evaluate, and modify probability models to describe simple and compound events.

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 7 Pacing Chart

Unit /Quarter 1		
# Days	Topics	Standards
35	<p><b>Number Sense</b></p> <ul style="list-style-type: none"> <li>Show that the distance between two rational numbers on the number line is the absolute value of their difference.</li> </ul> <p><b>Numerical Operation</b></p> <ul style="list-style-type: none"> <li>Use long division to convert a rational number to a decimal.</li> <li>Add, subtract, multiply and divide rational numbers using the properties of operations. Apply the convention of order of operations to add, subtract, multiply and divide rational numbers.</li> <li>Solve real world problems involving the four operations with rational numbers.</li> <li>Add and subtract linear expressions having rational coefficients, using properties of operations. Factor and expand linear expressions having rational coefficients, using properties of operations.</li> <li>Write expressions in equivalent forms to shed light on the problem and interpret the relationship between the quantities in the context of the problem.</li> </ul>	<p>7.NS.A.1 ▲</p> <p>7.NS.A.1A ▲</p> <p>7. NS.A.1B ▲</p> <p>7. NS.A.1.C ▲</p> <p>7. NS.A.2. ▲</p> <p>7. NS.A.2A ▲</p> <p>7. NS.A.2B ▲</p> <p>7. NS.A.2.C ▲</p> <p>7. NS.A.2D ▲</p> <p>7. NS.A.3 ▲</p> <p>7.EE.1. ▲</p> <p>7.EE.2 ▲</p>

## Unit /Quarter 2

# Days	Topics	Standards
35	<p><b>Ratio &amp; Proportion</b></p> <ul style="list-style-type: none"> <li>• Compute unit rates with ratios of fractions representing measurement quantities. in both like and different units of measure</li> <li>• Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</li> <li>• Use proportions to solve multistep percent problems including simple interest, tax, markups, discounts, gratuities, commissions, fees, percent increase, percent decrease, percent error.</li> </ul> <p><b>Linear Relationship</b></p> <ul style="list-style-type: none"> <li>• Write an equation of the form <math>px + q = r</math> or <math>p(x + q) = r</math> in order to solve a word problem. Fluently solve equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>.</li> <li>• Write an inequality of the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math> to solve a word problem. Graph the solution set of the inequality. Interpret the solution to an inequality in the context of the problem.</li> </ul>	<p>7.RP.1. ▲</p> <p>7.RP.2 ▲</p> <p>7.RP.2.A ▲</p> <p>7.RP.2.B ▲</p> <p>7.RP.2.C ▲</p> <p>7.RP.2.D ▲</p> <p>7.RP.3 ▲</p> <p>7.EE.3. ▲</p> <p>7.EE.4 ▲</p> <p>7.EE.4A ▲ ,</p> <p>7.EE.4B ▲</p>

**Unit / Quarter 3**

# Days	Topics	Standards
17	<p><b>Data and Statistics</b></p> <ul style="list-style-type: none"><li>Analyze and distinguish between representative and non-representative samples of a population.</li><li>Analyze data from a sample to draw inferences about the population. Generate multiple random samples of the same size. Analyze the variation in multiple random samples of the same size.</li></ul>	<p>7.SP.A.1 ●</p> <p>7.SP.A.2 ●</p> <p>7.SP.B.3 ■</p> <p>7.SP.B.4 ■</p>

18	<p><b>Probability</b></p> <ul style="list-style-type: none"> <li>• Predict the approximate relative frequency given the theoretical probability. Use a uniform probability model to determine the probabilities of events. Develop (non-uniform) probability models by observing frequencies in data that has been generated from a chance process.</li> <li>• Use designed simulations to generate frequencies for compound events</li> </ul>	<p>7.SP.C.5 ●</p> <p>7.SP.C.6 ●</p> <p>7.SP.C.7 ●</p> <p>7.SP.C.7a ●</p> <p>7.SP.C.7b ●</p> <p>7.SP.C.8 ●</p> <p>7.SP.C.8a. ●</p> <p>7SP.C.8b ●</p> <p>7.SP.C.8c ●</p> <p>7.SP.C.8d ●</p>
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Unit / Quarter 4		
# Days	Topics	Standard
35	<ul style="list-style-type: none"> <li>• solve real-world and mathematical problems involving area of two dimensional objects composed of triangles, quadrilaterals, and polygons</li> <li>• solve real-world and mathematical problems involving surface area of three-dimensional objects composed of cubes and right prisms</li> <li>• analyze three dimensional shapes (right rectangular pyramids and prisms) by examining and describing all of the 2-dimensional figures that result from slicing it at various angles.</li> </ul>	<p>7.EE.B.4 ▲</p> <p>7.EE.B.4a ▲</p> <p>7.EE.B.4b ▲</p> <p>7.G.3 ■</p> <p>7.G.4 ■</p>

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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.