<table>
<thead>
<tr>
<th>Grade 7: Suggested Sequence for CMP3¹</th>
<th>Suggested Instructional Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1</strong> Accentuate the Negative: Integers and Rational Numbers</td>
<td>22 days</td>
</tr>
<tr>
<td><strong>Unit 2</strong> Stretching and Shrinking: Understanding Similarity</td>
<td>18 days</td>
</tr>
<tr>
<td><strong>NYCDOE Fall Benchmark Assessment</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Unit 3</strong> Comparing and Scaling: Ratios, Rates, Percents, and Proportions</td>
<td>16 days</td>
</tr>
<tr>
<td><strong>Unit 4</strong> Moving Straight Ahead: Linear Relationships</td>
<td>26 days</td>
</tr>
<tr>
<td><strong>Unit 5</strong> What Do You Expect? Probability and Expected Value</td>
<td>28 days</td>
</tr>
<tr>
<td><strong>NYCDOE Spring Benchmark Assessment</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Unit 6</strong> Filling and Wrapping: Three-Dimensional Measurement</td>
<td>24 days</td>
</tr>
<tr>
<td><strong>Unit 7</strong> Samples and Populations: Making Comparisons and Predictions</td>
<td>23 days</td>
</tr>
<tr>
<td><strong>State Examination</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Unit 8</strong> Shapes and Designs: Two-Dimensional Geometry</td>
<td>21 days</td>
</tr>
</tbody>
</table>

¹This Scope and Sequence represents one way a school may teach the full year’s content and incorporates the state’s pre-post test standards. As the transition to the PARCC assessments progresses, schools may choose to make decisions around the sequence and pacing of Units that address post-test concepts prior to the state examination in consideration of the state’s testing program guidance (see http://www.p12.nysed.gov/assessment/math/math-ei.html).
<table>
<thead>
<tr>
<th>Instructional Time</th>
<th>22 days</th>
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</thead>
<tbody>
<tr>
<td>Essential Ideas</td>
<td>Rational numbers can be compared, ordered, and located on a number line. They can also be used to indicate a distance or difference between points on a number line. Number lines are useful models for solving problems with rational numbers. Models facilitate understanding the meaning of addition, subtraction, multiplication, and division of positive and negative numbers and improve understanding of the standard algorithms for these operations. Mathematical sentences, with or without variables, can model real-world problems. Sometimes rewriting a problem using a different operation can be helpful in finding the solution. Properties of operations extend to all rational numbers and understanding these properties is helpful in solving problems.</td>
</tr>
<tr>
<td>Goals</td>
<td>Develop understanding of rational numbers by including negative rational numbers. Develop understanding of operations with rational numbers and their properties.</td>
</tr>
<tr>
<td>Main Common Core Standards</td>
<td>Common Core Content Standards 7.NS.A.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. 7.NS.A.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 7.NS.A.3: Solve real-world and mathematical problems involving the four operations with rational numbers. 7.EE.B.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. 7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. Common Core Standards for Mathematical Practice MP1: Make sense of problems and persevere in solving them. MP2: Reason abstractly and quantitatively. MP3: Construct viable arguments and critique the reasoning of others. MP4: Model with mathematics. MP5: Use appropriate tools strategically. MP6: Attend to precision. MP7: Look for and make use of structure. MP8: Look for and express regularity in repeated reasoning.</td>
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<tr>
<td>Fluency Goals*</td>
<td>Solve multistep problems posed with positive and negative rational numbers. Fluently add, subtract, multiply, and divide rational numbers.</td>
</tr>
<tr>
<td>Assessments</td>
<td>Unit Readiness Partner Quiz Check-up Unit Project Self-Assessment Unit Test</td>
</tr>
</tbody>
</table>

*CMP3 develops fluency in procedural skills from a foundation of conceptual understanding, an approach that leads to long-term retention of skills and ability to apply those skills in problem solving.
### STRETCHING AND SHRINKING Understanding Similarity

<table>
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<tr>
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</table>
| Essential Ideas:   | • Similar figures have congruent corresponding angles and corresponding sides lengths are in a proportional relationship.  
• The scale factor for two similar figures is established by finding the ratio of a pair of corresponding sides. Scale factor, used with other tools, allows you to make drawings of similar figures and to compare the perimeters and areas of similar figures.  
• If two figures are similar, then you can use a proportional relationship between corresponding sides to find unknown side lengths. |
| Goals:             | • Understand what it means for figures to be similar.  
• Develop strategies for using similar figures to solve problems. |
| Main Common Core Standards: | **Common Core Content Standards**  
7.RP.A.2: Recognize and represent proportional relationships between quantities.  
7.RP.A.3: Use proportional relationships to solve multistep ratio and percent problems.  
7.EE.B.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.  
7.G.A.1: Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.  
7.G.A.2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. |
| Fluency Goals*:    | • Solve multistep problems posed with positive and negative rational numbers.  
• Fluently add, subtract, multiply, and divide rational numbers.  
• Divide fractions.** |
| Assessments:       | Unit Readiness Check-up 1  
Partner Quiz  
Check-up 2  
Unit Project  
Self-Assessment  
Unit Test |
| NYCDOE Fall Benchmark Assessment |

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*CMP3 develops fluency in procedural skills from a foundation of conceptual understanding, an approach that leads to long-term retention of skills and ability to apply those skills in problem solving.  
**reinforcing fluency expectations from previous grades
## Comparing and Scaling
Ratios, Rates, Percents, and Proportions

<table>
<thead>
<tr>
<th>Instructional Time</th>
<th>16 days</th>
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| Essential Ideas | - Ratios make comparisons between two parts of the whole or one part to the whole. Rates, unit rates, and percents are all types of ratios.  
- Being able to change the form of a ratio is a useful problem-solving strategy.  
- A proportional relationship has particular characteristics when represented in a table, graph or equation.  
- Knowing the desired ratio between two variables allows you to scale the ratio or find a missing part of a ratio. |
| Goals | - Find and use ratios, rates, and percents.  
- Represent and recognize proportionality in tables, graphs and equations.  
- Develop and use strategies for solving problems that require proportional reasoning. |
| Main Common Core Standards | - 7.RP.A.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.  
- 7.RP.A.2: Recognize and represent proportional relationships between quantities.  
- 7.RP.A.3: Use proportional relationships to solve multistep ratio and percent problems.  
- 7.EE.A.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.  
- Common Core Standards for Mathematical Practice  
  MP1: Make sense of problems and persevere in solving them.  
  MP2: Reason abstractly and quantitatively.  
  MP3: Construct viable arguments and critique the reasoning of others.  
  MP4: Model with mathematics.  
  MP5: Use appropriate tools strategically.  
  MP6: Attend to precision.  
  MP7: Look for and make use of structure.  
  MP8: Look for and express regularity in repeated reasoning. |
| Fluency Goals* | - Solve multistep problems posed with positive and negative rational numbers.  
- Fluently add, subtract, multiply, and divide rational numbers.  
- Divide fractions.** |
| Assessments | Unit Readiness  
Check-up 1  
Partner Quiz  
Check-up 2  
Unit Project  
Self-Assessment  
Unit Test |

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**reinforcing fluency expectations from previous grades
### MOVING STRAIGHT AHEAD Linear Relationships

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<th>Essential Ideas</th>
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| 26 days            | • Two variables are in a linear relationship if one variable is changing by a constant amount when the other variable changes by increments of 1 unit.  
• The rate of change in a linear relationship is represented by the slope of the line representing the relationship.  
• The equation $y = mx$ is a particular kind of linear relationship where $x$ and $y$ are proportional to each other.  
• Solutions for linear equations of the form $y = mx + b$ are pairs of values $(x, y)$ which make this equation true. Graphically, solution pairs are points on the graph of the line.  
• Properties of equality can be used to maintain equivalent expressions on each side of the equation when finding a solution. |

<table>
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| • Recognize problem situations in which two or more variables have a linear relationship to each other.  
• Understand that the equality sign indicates that two expressions are equivalent. |

<table>
<thead>
<tr>
<th>Main Common Core Standards</th>
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<td>Common Core Content Standards</td>
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<tr>
<td>7.RP.A.2: Recognize and represent proportional relationships between quantities.</td>
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<tr>
<td>7.EE.A.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</td>
</tr>
<tr>
<td>7.EE.A.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.</td>
</tr>
<tr>
<td>7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</td>
</tr>
<tr>
<td>Common Core Standards for Mathematical Practice</td>
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<td>MP1: Make sense of problems and persevere in solving them.</td>
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<td>• Solve multistep problems posed with positive and negative rational numbers in any form.</td>
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<td>• Solve one-variable equations of the form $px + q = r$ and $p(x + q) = r$ fluently.</td>
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Check-up 1  
Partner Quiz  
Check-up 2  
Unit Project  
Self-Assessment  
Unit Test |

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**Grade 7**

### WHAT DO YOU EXPECT? Probability and Expected Value

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<tr>
<th>Instructional Time</th>
<th>28 days</th>
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</table>
| **Essential Ideas** | • Probabilities are ratios. Probability can be used to predict outcomes in real-world events or to analyze games for fairness.  
• Theoretical probability is determined by reasoning about the likelihood of a specific outcome based on all possible outcomes of an event. Lists, tree diagrams, or area models can show all of the possible outcomes and can be used to determine the theoretical probability of a compound event.  
• The experimental probability of an event can be found by gathering data from experiments or observations, counting the number of times the specified outcome occurred, and comparing that to the number of trials. Long run relative frequencies collected from experiments make good approximations of theoretical probabilities. |
| **Goals** | • Explore and learn basic probability concepts and understand that there are two ways to build probability models: by gathering data from experiments (experimental probability) and by analyzing the possible equally likely outcomes (theoretical probability).  
• Explore and develop probability models by identifying possible outcomes and analyze probabilities to solve problems. |

| **Main Common Core Standards** | Common Core Content Standards  
7.SP.C.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.  
7.SP.C.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.  
7.SP.C.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.  
7.SP.C.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. |
| **Common Core Standards for Mathematical Practice** | MP1: Make sense of problems and persevere in solving them.  
MP2: Reason abstractly and quantitatively.  
MP3: Construct viable arguments and critique the reasoning of others.  
MP4: Model with mathematics.  
MP5: Use appropriate tools strategically.  
MP6: Attend to precision.  
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MP8: Look for and express regularity in repeated reasoning. |

| **Fluency Goals** | • Solve multistep problems posed with positive and negative rational numbers.  
• Fluently add, subtract, multiply, and divide rational numbers. |
| **Assessments** | Unit Readiness Check-up 1  
Partner Quiz  
Check-up 2  
Unit Project  
Self-Assessment  
Unit Test  
Unit Test |

**NYCDOE Spring Benchmark Assessment**

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**NEW YORK CITY SCOPE AND SEQUENCE FOR CMP3**

### Grade 7

#### FILLING AND WRAPPING  Three-Dimensional Measurement

<table>
<thead>
<tr>
<th>Instructional Time</th>
<th>24 days</th>
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**Essential Ideas**
- Prisms are named for their bases. The name of a prism indicates the number of vertices, edges, and faces the prism has.
- Slicing prisms vertically, horizontally, or on a slant, can expose different shapes of cross-sections, depending on which of the original edges are intersected.
- Comparing, reasoning about, and extending what you know about area and volume leads to an understanding of the formulas for finding the surface area and volume of prisms, cones, and pyramids.
- Proportional changes to dimensions of the sides of a prism leads to predictable changes in the surface area and the volume.
- Approximations of the ratio of the circumference of a circle to the circle’s diameter leads to exact formulas for the area and circumference of a circle.

**Goals**
- Understand surface area and volume of prisms and cylinders and how they are related.
- Understand the area and circumference of circles and how they are related.
- Understand the relationship between the volume of cylinders and cones, spheres, and pyramids.

**Main Common Core Standards**
- **7.RP.A.2:** Recognize and represent proportional relationships between quantities.
- **7.NS.A.3:** Solve real-world and mathematical problems involving the four operations with rational numbers.
- **7.G.A.3:** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
- **7.G.B.4:** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
- **7.G.B.6:** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

**Common Core Standards for Mathematical Practice**
- **MP1:** Make sense of problems and persevere in solving them.
- **MP2:** Reason abstractly and quantitatively.
- **MP3:** Construct viable arguments and critique the reasoning of others.
- **MP4:** Model with mathematics.
- **MP5:** Use appropriate tools strategically.
- **MP6:** Attend to precision.
- **MP7:** Look for and make use of structure.
- **MP8:** Look for and express regularity in repeated reasoning.

**Fluency Goals**
- Solve multistep problems posed with positive and negative rational numbers.
- Fluently add, subtract, multiply, and divide rational numbers.
- Solve one-variable equations of the form $px + q = r$ and $p(x + q) = r$ fluently.

**Assessments**
- Unit Readiness Check-up
- Partner Quiz
- Check-up 1
- Unit Project
- Self-Assessment
- Unit Test

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## SAMPLES AND POPULATIONS  Data and Statistics

<table>
<thead>
<tr>
<th><strong>Instructional Time</strong></th>
<th>23 days</th>
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</table>

### Essential Ideas
- A survey allows you to gather data using a sample of a population and use that data to represent the population. Tables and graphs, as well as measures of center and variability enable you to compare data from different samples and draw conclusions about the samples and the populations.
- Random samples are without bias, and therefore are useful for predicting population characteristics. Probability models allow you to select a random sample from a population. Random samples, even of the same size, vary from each other and from the underlying population.
- You can compare two samples with approximately the same measure of variability by using that measure to determine the distance between the centers of the samples.

### Goals
- Understand and use the process of statistical investigation.
- Understand data distributions and what it means to analyze them.
- Understand that statistics can be used to gain information about a population by examining a representative sample of the population.

### Main Common Core Standards
- **7.SP.A.1:** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
- **7.SP.A.2:** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
- **7.SP.B.3:** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
- **7.SP.B.4:** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

### Fluency Goals*
- Solve multistep problems posed with positive and negative rational numbers.
- Fluently add, subtract, multiply, and divide rational numbers.

### Assessments
- Unit Readiness Check-up 1
- Partner Quiz A
- Partner Quiz B
- Self-Assessment Unit Test

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# SHAPES AND DESIGNS  Two-Dimensional Geometry

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<thead>
<tr>
<th>Instructional Time</th>
<th>21 days</th>
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</table>
| Essential Ideas    | - The sum of the interior angles of a polygon relates to the number of triangles that are formed by drawing diagonals from one vertex.  
- Triangles have 3 sides, but not every combination of 3 side lengths will make a triangle.  
- As with triangles, specific combinations of side lengths of a polygon can produce congruent copies of the polygon.  
- Angles can be classified by their size, their location in relation to each other in a figure or design, and their combined angle measure. Angle classification by location or combined angle measure can help you write equations to find unknown angle measures. |
| Goals              | - Understand the properties of polygons that affect their shape.  
- Understand special relationships among angles.  
- Understand the properties needed to construct polygons. |
| Main Common Core Standards | Common Core Content Standards  
7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  
7.G.A.2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.  
7.G.B.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.  
Common Core Standards for Mathematical Practice  
MP1: Make sense of problems and persevere in solving them.  
MP2: Reason abstractly and quantitatively.  
MP3: Construct viable arguments and critique the reasoning of others.  
MP4: Model with mathematics.  
MP5: Use appropriate tools strategically.  
MP6: Attend to precision.  
MP7: Look for and make use of structure.  
MP8: Look for and express regularity in repeated reasoning. |
| Fluency Goals*     | - Operate with multidigit decimals fluently.** |
| Assessments        | Unit Readiness  
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Partner Quiz  
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