

**A Correlation of**  
**Connected Mathematics Project 3**  
**(CMP3) ©2018**



**CMP<sup>TM</sup> 3**

**to the**

**Alabama Course of Study**  
**Mathematics 2019**

**Grade 7**

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To the Alabama Course of Study Mathematics 2019**

Alabama Course of Study Mathematics 2019 Grade 7	Connected Mathematics Project 3 Grade 7 Investigations
<b>Student Mathematical Practices</b>	
<b>1. Make sense of problems and persevere in solving them..</b>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:</p> <p><b>Shapes and Designs:</b> Inv. 1, Inv. 2</p> <p><b>Moving Straight Ahead:</b> Inv. 1, Inv. 2</p> <p><b>Stretching and Shrinking:</b> Inv. 2, Inv. 3, Inv. 4</p> <p><b>Samples and Populations:</b> Inv. 1, Inv. 2, Inv. 3</p> <p><b>Filling and Wrapping:</b> Inv. 1, Inv. 4</p> <p><b>What Do You Expect?:</b> Inv. 1, Inv. 2, Inv. 3</p>
<b>2. Reason abstractly and quantitatively.</b>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:</p> <p><b>Moving Straight Ahead:</b> Inv. 1</p> <p><b>Stretching and Shrinking:</b> Inv. 4</p> <p><b>Samples and Populations:</b> Inv. 3</p> <p><b>Filling and Wrapping:</b> Inv. 1, Inv. 4</p> <p><b>Accentuate the Negative:</b> Inv. 3, Inv. 4</p> <p><b>What Do You Expect?:</b> Inv. 4</p>

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Alabama Course of Study Mathematics 2019 Grade 7	Connected Mathematics Project 3 Grade 7 Investigations
<p><b>3. Construct viable arguments and critique the reasoning of others.</b></p>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:  <b>Shapes and Designs:</b>            Inv. 1  <b>Comparing and Scaling:</b>            Inv. 2  <b>Moving Straight Ahead:</b>            Inv. 3  <b>Stretching and Shrinking:</b>            Inv. 2  <b>Samples and Populations:</b>            Inv. 1  <b>Filling and Wrapping:</b>            Inv. 4  <b>Accentuate the Negative:</b>            Inv. 1  <b>What Do You Expect?:</b>            Inv. 2, Inv. 3</p>
<p><b>4. Model with mathematics.</b> ing the model if it has not served its purpose.</p>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:  <b>Shapes and Designs:</b>            Inv. 2  <b>Comparing and Scaling:</b>            Inv. 2            Inv. 3  <b>Moving Straight Ahead:</b>            Inv. 4  <b>Stretching and Shrinking:</b>            Inv. 3  <b>Samples and Populations:</b>            Inv. 1, Inv. 3  <b>Filling and Wrapping:</b>            Inv. 3  <b>Accentuate the Negative:</b>            Inv. 3  <b>What Do You Expect?:</b>            Inv. 1, Inv. 4</p>

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Alabama Course of Study Mathematics 2019 Grade 7	Connected Mathematics Project 3 Grade 7 Investigations
<p><b>5. Use appropriate tools strategically.</b></p>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:</p> <p><b>Shapes and Designs:</b> Inv. 3</p> <p><b>Comparing and Scaling:</b> Inv. 2, Inv. 3</p> <p><b>Moving Straight Ahead:</b> Inv. 3</p> <p><b>Stretching and Shrinking:</b> Inv. 1</p> <p><b>Samples and Populations:</b> Inv. 2, Inv. 3</p> <p><b>Filling and Wrapping:</b> Inv. 2</p> <p><b>Accentuate the Negative:</b> Inv. 1</p> <p><b>What Do You Expect?:</b> Inv. 3, Inv. 5</p>
<p><b>6. Attend to precision..</b></p>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:</p> <p><b>Shapes and Designs:</b> Inv. 3</p> <p><b>Comparing and Scaling:</b> Inv. 1</p> <p><b>Moving Straight Ahead:</b> Inv. 2</p> <p><b>Stretching and Shrinking:</b> Inv. 4</p> <p><b>Samples and Populations:</b> Inv. 1, Inv. 3</p> <p><b>Filling and Wrapping:</b> Inv. 1</p> <p><b>Accentuate the Negative:</b> Inv. 4</p> <p><b>What Do You Expect?:</b> Inv. 4</p>

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<p><b>7. Look for and make use of structure.</b></p>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:  <b>Shapes and Designs:</b>            Inv. 2  <b>Comparing and Scaling:</b>            Inv. 3  <b>Moving Straight Ahead:</b>            Inv. 1, Inv. 2  <b>Stretching and Shrinking:</b>            Inv. 4  <b>Samples and Populations:</b>            Inv. 2, Inv. 3  <b>Filling and Wrapping:</b>            Inv. 3  <b>Accentuate the Negative:</b>            Inv. 2  <b>What Do You Expect?:</b>            Inv. 1, Inv. 2</p>
<p><b>8. Look for and express regularity in repeated reasoning.</b></p>	<p>The Standards for Mathematical Practice can be met throughout the CMP3 program. For specific examples, please see:  <b>Shapes and Designs:</b>            Inv. 2  <b>Comparing and Scaling:</b>            Inv. 3  <b>Moving Straight Ahead:</b>            Inv. 1, Inv. 2  <b>Stretching and Shrinking:</b>            Inv. 4  <b>Samples and Populations:</b>            Inv. 3  <b>Filling and Wrapping:</b>            Inv. 2  <b>Accentuate the Negative:</b>            Inv. 2  <b>What Do You Expect?:</b>            Inv. 2</p>

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<b>Proportional Reasoning</b>	
Analyze proportional relationships and use them to solve real-world and mathematical problems.	
1. Calculate unit rates of length, area, and other quantities measured in like or different units that include ratios of fractions.	<b>Comparing and Scaling:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR
2. Represent a relationship between two quantities and determine whether the two quantities are related proportionally.	<b>Stretching and Shrinking:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Comparing and Scaling:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR <b>Moving Straight Ahead:</b> Inv. 1, ACE, MR <b>What Do You Expect?:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR <b>Filling and Wrapping:</b> Inv. 1, ACE, MR <b>Samples and Populations:</b> Inv. 3, ACE, MR
a. Use equivalent ratios displayed in a table or in a graph of the relationship in the coordinate plane to determine whether a relationship between two quantities is proportional.	<b>Stretching and Shrinking:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Comparing and Scaling:</b> Inv. 2, ACE, MR <b>Moving Straight Ahead:</b> Inv. 1, ACE, MR
b. Identify the constant of proportionality (unit rate) and express the proportional relationship using multiple representations including tables, graphs, equations, diagrams, and verbal descriptions.	<b>Stretching and Shrinking:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Comparing and Scaling:</b> Inv. 2, ACE, MR <b>Moving Straight Ahead:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR
c. Explain in context the meaning of a point $(x,y)$ on the graph of a proportional relationship, with special attention to the points $(0,0)$ and $(1, r)$ where $r$ is the unit rate.	<b>Comparing and Scaling:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR <b>Moving Straight Ahead:</b> Inv. 2, ACE, MR, Inv. 4, ACE, MR

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3. Solve multi-step percent problems in context using proportional reasoning, including simple interest, tax, gratuities, commissions, fees, markups and markdowns, percent increase, and percent decrease.	<b>Stretching and Shrinking:</b> Inv. 4, ACE, MR <b>Comparing and Scaling:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR
<b>Number Systems and Operations</b>	
Apply and extend prior knowledge of addition, subtraction, multiplication, and division to operations with rational numbers.	
4. Apply and extend knowledge of operations of whole numbers, fractions, and decimals to add, subtract, multiply, and divide rational numbers including integers, signed fractions, and decimals.	<b>Accentuate the Negative:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 4, ACE, MR <b>Samples and Populations:</b> Inv. 3, ACE, MR
a. Identify and explain situations where the sum of opposite quantities is 0 and opposite quantities are defined as additive inverses.	<b>Accentuate the Negative:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR
b. Interpret the sum of two or more rational numbers, by using a number line and in real-world contexts.	<b>Accentuate the Negative:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR
c. Define subtraction of rational numbers as addition of additive inverses.	<b>Accentuate the Negative:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR
d. Use a number line to demonstrate that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	<b>Accentuate the Negative:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR
e. Extend strategies of multiplication to rational numbers to develop rules for multiplying signed numbers, showing that the properties of the operations are preserved.	<b>Accentuate the Negative:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR
f. Divide integers and explain that division by zero is undefined. Interpret the quotient of integers (with a nonzero divisor) as a rational number.	<b>Accentuate the Negative:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR
g. Convert a rational number to a decimal using long division, explaining that the decimal form of a rational number terminates or eventually repeats.	<b>Accentuate the Negative:</b> Inv. 3, ACE

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<b>Alabama Course of Study Mathematics 2019 Grade 7</b>	<b>Connected Mathematics Project 3 Grade 7 Investigations</b>
5. Solve real-world and mathematical problems involving the four operations of rational numbers, including complex fractions. Apply properties of operations as strategies where applicable.	<b>Accentuate the Negative:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Comparing and Scaling:</b> Inv. 3, ACE, MR
<b>Algebra and Functions</b>	
Create equivalent expressions using the properties of operations.	
6. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	<b>Moving Straight Ahead:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Filling and Wrapping:</b> Inv. 3, ACE, MR
7. Generate expressions in equivalent forms based on context and explain how the quantities are related.	<b>Shapes and Designs:</b> Inv. 2, ACE, MR <b>Moving Straight Ahead:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Filling and Wrapping:</b> Inv. 1, ACE, MR, Inv. 3, ACE, MR
Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.	
8. Solve multi-step, real-world and mathematical problems involving rational numbers (integers, signed fractions and decimals), converting between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.	<b>Accentuate the Negative:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Stretching and Shrinking:</b> Inv. 4, ACE, MR <b>Comparing and Scaling:</b> Inv. 3, ACE, MR <b>Moving Straight Ahead:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR
9. Use variables to represent quantities in real-world or mathematical problems and construct algebraic expressions, equations, and inequalities to solve problems by reasoning about the quantities.	<b>Shapes and Designs:</b> Inv. 2, ACE, MR <b>Accentuate the Negative:</b> Inv. 1, ACE, MR <b>Stretching and Shrinking:</b> Inv. 4, ACE, MR <b>Moving Straight Ahead:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR



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a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$ , where $p$ , $q$ , and $r$ are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.	<b>Comparing and Scaling:</b> Inv. 2, ACE, Inv. 3, ACE, MR <b>Moving Straight Ahead:</b> Inv 1, Inv 2, Inv. 3, ACE, MR, Inv 4
b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$ , where $p$ , $q$ , and $r$ are specific rational numbers. Graph the solution set of the inequality, and interpret it in the context of the problem.	<b>Accentuate the Negative:</b> Inv. 1, ACE <b>Moving Straight Ahead:</b> Inv. 3, ACE, MR
<b>Data Analysis, Statistics, and Probability</b>	
Make inferences about a population using random sampling.	
10. Examine a sample of a population to generalize information about the population.	<b>Samples and Populations:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR
a. Differentiate between a sample and a population.	<b>Samples and Populations:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR
b. Compare sampling techniques to determine whether a sample is random and thus representative of a population, explaining that random sampling tends to produce representative samples and support valid inferences.	<b>Samples and Populations:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR
c. Determine whether conclusions and generalizations can be made about a population based on a sample.	<b>Samples and Populations:</b> Inv. 3, ACE, MR
d. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest, generating multiple samples to gauge variation and making predictions or conclusions about the population.	<b>Samples and Populations:</b> Inv. 1, ACE, MR, Inv. 3, ACE, MR
e. Informally explain situations in which statistical bias may exist.	CMP3 informally explains situations in which selection bias might occur by describing methods for choosing a representative sample. <b>Samples and Populations:</b> Inv. 2, ACE, MR

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Alabama Course of Study Mathematics 2019 Grade 7	Connected Mathematics Project 3 Grade 7 Investigations
Make inferences from an informal comparison of two populations.	
11. 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.	<b>Samples and Populations:</b> Inv. 1, ACE, MR, Inv. 3, ACE, MR
12. Make informal comparative inferences about two populations using measures of center and variability and/or mean absolute deviation in context.	<b>Samples and Populations:</b> Inv. 1, Inv. 3, ACE, MR
Investigate probability models.	
13. Use a number from 0 to 1 to represent the probability of a chance event occurring, explaining that larger numbers indicate greater likelihood of the event occurring, while a number near zero indicates an unlikely event.	<b>What Do You Expect?:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR <b>Samples and Populations:</b> Inv. 3, ACE, MR
14. Define and develop a probability model, including models that may or may not be uniform, where uniform models assign equal probability to all outcomes and non-uniform models involve events that are not equally likely.	<b>What Do You Expect?:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR
a. Collect and use data to predict probabilities of events.	<b>What Do You Expect?:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR <b>Samples and Populations:</b> Inv. 3, ACE, MR
b. Compare probabilities from a model to observed frequencies, explaining possible sources of discrepancy.	<b>What Do You Expect?:</b> Inv. 1, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR <b>Samples and Populations:</b> Inv. 3, ACE, MR
15. Approximate the probability of an event using data generated by a simulation (experimental probability) and compare it to the theoretical probability.	<b>What Do You Expect?:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR

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a. Observe the relative frequency of an event over the long run, using simulation or technology and use those results to predict approximate relative frequency.	<b>What Do You Expect?:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR
16. Find probabilities of simple and compound events through experimentation or simulation and by analyzing the sample space, representing the probabilities as percents, decimals, or fractions.	<b>What Do You Expect?:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR
a. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams, and determine the probability of an event by finding the fraction of outcomes in the sample space for which the compound event occurred.	<b>What Do You Expect?:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR
b. Design and use a simulation to generate frequencies for compound events.	<b>What Do You Expect?:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR
c. Represent events described in everyday language in terms of outcomes in the sample space which composed the event.	<b>What Do You Expect?:</b> Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR, Inv. 5, ACE, MR
<b>Geometry and Measurement</b>	
Construct and describe geometric figures, analyzing relationships among them.	
17. Solve problems involving scale drawings of geometric figures, including computation of actual lengths and areas from a scale drawing and reproduction of a scale drawing at a different scale.	<b>Stretching and Shrinking:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR, Inv. 4, ACE, MR <b>Filling and Wrapping:</b> Inv. 1, ACE, MR
18. Construct geometric shapes (freehand, using a ruler and a protractor, and using technology), given a written description or measurement constraints with an emphasis 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.	<b>Stretching and Shrinking:</b> Inv. 1, ACE, MR, Inv. 3, ACE, MR <b>Shapes and Designs:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 3, ACE, MR
19. Describe the two-dimensional figures created by slicing three-dimensional figures into plane sections.	<b>Filling and Wrapping:</b> Inv. 2, ACE, MR, Inv. 3 ACE, Inv. 4 ACE

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Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.	
20. Explain the relationships among circumference, diameter, area, and radius of a circle to demonstrate understanding of formulas for the area and circumference of a circle.	<b>Filling and Wrapping:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR
a. Informally derive the formula for area of a circle.	<b>Filling and Wrapping:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR
b. Solve area and circumference problems in real-world and mathematical situations involving circles.	<b>Filling and Wrapping:</b> Inv. 3, ACE, MR, Inv. 4, ACE, MR
21. Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure.	<b>Shapes and Designs:</b> Inv. 3, ACE, MR
22. 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 rectangular prisms.	<b>Filling and Wrapping:</b> Inv. 1, ACE, MR, Inv. 2, ACE, MR, Inv. 4, ACE, MR

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