


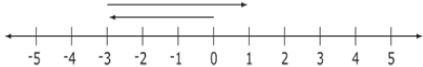
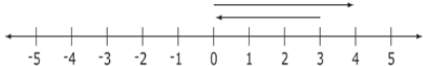
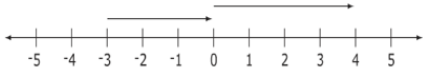
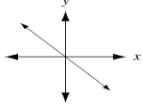
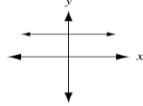
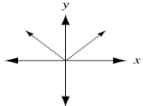
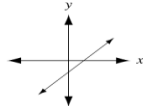
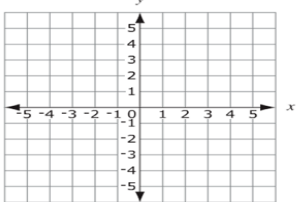
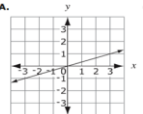
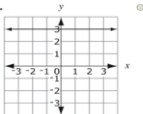
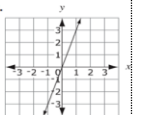


7th Grade MCA3 Standards, Benchmarks, Examples, Test Specifications & Sampler Questions

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item
Number & Operation MCA 12-16 Items Modified MCA 7-9 Items	Read, write, represent and compare positive and negative rational numbers, expressed as integers, fractions and decimals. MCA 4-6 Items Modified MCA 2-4 Items	7.1.1.1	<p>Know that every rational number can be written as the ratio of two integers or as a terminating or repeating decimal. Recognize that π is not rational, but that it can be approximated by rational numbers such as $\frac{22}{7}$ and 3.14. (I.2)</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> Allowable notation: π (written as a symbol, not as “pi”) Vocabulary allowed in items: terminating, repeating “and vocabulary given at previous grades” (&vgapp.) 	<p>Which numbers are rational?</p> <p>Click on the numbers you want to select.</p> <p>2.0 $1\frac{7}{8}$ π $\sqrt{5}$ 6.39</p>
		7.1.1.2	<p>Understand that division of two integers will always result in a rational number. Use this information to interpret the decimal result of a division problem when using a calculator. (I.2)</p> <p><u>For example:</u> $\frac{125}{30}$ gives 4.16666667 on a calculator. This answer is not exact. The exact answer can be expressed as $4\frac{1}{6}$, which is the same as $4.\overline{16}$. The calculator expression does not guarantee that the 6 is repeated, but that possibility should be anticipated.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> Vocabulary allowed in items: terminating, repeating &vgapp. 	<p>An equation is shown.</p> $n = 1 \div 17$ <p>Which describes n?</p> <p><input type="radio"/> A. Integer</p> <p><input type="radio"/> B. Irrational</p> <p><input type="radio"/> C. Rational</p> <p><input type="radio"/> D. Whole</p>
		7.1.1.3	<p>Locate positive and negative rational numbers on a number line, understand the concept of opposites, and plot pairs of positive and negative rational numbers on a coordinate grid. (I.2)</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> Vocabulary allowed in items: opposite, coordinate, origin &vgapp. 	<p>Four points are graphed on a line.</p>  <p>Which point is located at the opposite of -2?</p> <p><input type="radio"/> A. Point J</p> <p><input type="radio"/> B. Point K</p> <p><input type="radio"/> C. Point L</p> <p><input type="radio"/> D. Point M</p> <p>Modified Example</p> <p>Which letter represents -4.1 on the number line?</p>  <p><input type="radio"/> A. Point J</p> <p><input type="radio"/> B. Point K</p> <p><input type="radio"/> C. Point L</p>

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item									
		7.1.1.4	<p>Compare positive and negative rational numbers expressed in various forms using the symbols $<$, $>$, $=$, \leq, \geq. (1.2)</p> <p><i>For example:</i> $-\frac{1}{2} < -0.36$.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: vocabulary given at previous grades 	<p>Which statement is true?</p> <p><input type="radio"/> A. $0.75 < 0.75^2$</p> <p><input type="radio"/> B. $-\frac{3}{8} < -0.38$</p> <p><input type="radio"/> C. $\frac{46}{25} > 1\frac{5}{6}$</p> <p><input type="radio"/> D. $-2\frac{3}{5} > 1.5$</p>									
		7.1.1.5	<p>Recognize and generate equivalent representations of positive and negative rational numbers, including equivalent fractions. (1.2)</p> <p><i>For example:</i> $\frac{40}{12} = \frac{120}{36} = \frac{10}{3} = 3.\bar{3}$.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: vocabulary given at previous grades 	<p>Which is equivalent to $5\frac{2}{15}$?</p> <p><input type="radio"/> A. $5.\bar{13}$</p> <p><input type="radio"/> B. $5.\bar{13}$</p> <p><input type="radio"/> C. 5.13</p> <p><input type="radio"/> D. $5.\bar{3}$</p> <p>Modified Example</p> <p>The table shows the percentage of students from different grades in a gym class.</p> <table border="1"> <thead> <tr> <th colspan="3">Students in a Gym Class</th> </tr> <tr> <th>6th Graders</th> <th>7th Graders</th> <th>8th Graders</th> </tr> </thead> <tbody> <tr> <td>30%</td> <td>50%</td> <td>?</td> </tr> </tbody> </table> <p>What fraction of the students are 8th graders?</p> <p>A. $\frac{1}{20}$</p> <p>B. $\frac{1}{5}$</p> <p>C. $\frac{4}{5}$</p>	Students in a Gym Class			6th Graders	7th Graders	8th Graders	30%	50%	?
Students in a Gym Class													
6th Graders	7th Graders	8th Graders											
30%	50%	?											
Calculate with positive and negative rational numbers, and rational numbers with whole number exponents, to solve real-world and mathematical problems.		7.1.2.1	<p>Add, subtract, multiply and divide positive and negative rational numbers that are integers, fractions and terminating decimals; use efficient and generalizable procedures, including standard algorithms; raise positive rational numbers to whole-number exponents. (1.7)</p> <p><i>For example:</i> $3^4 \times \left(\frac{1}{2}\right)^2 = \frac{81}{4}$.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Items must not have context • Vocabulary allowed in items: vocabulary given at previous grades 	<p>Simplify.</p> <p>$3(2.25)^2$</p> <p>Type your answer in the box.</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 5px auto;"></div> <p>Modified Example</p> <p>Simplify.</p> <p>$5^2 + 3^3$</p> <p><input type="radio"/> A. 19</p> <p><input type="radio"/> B. 34</p> <p><input type="radio"/> C. 52</p>									

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item
	<p>MCA 8-10 Items Modified MCA 4-7 Items</p>	<p>7.1.2.2</p>	<p>Use real-world contexts and the inverse relationship between addition and subtraction to explain why the procedures of arithmetic with negative rational numbers make sense. (1.7)</p> <p><i>For example:</i> Multiplying a distance by -1 can be thought of as representing that same distance in the opposite direction. Multiplying by -1 a second time reverses directions again, giving the distance in the original direction.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: inverse & vgapg. 	<p>Which shows a model of $-3+4$?</p> <p><input type="radio"/> A. </p> <p><input type="radio"/> B. </p> <p><input type="radio"/> C. </p> <p><input type="radio"/> D. </p>
		<p>7.1.2.3</p>	<p>Understand that calculators and other computing technologies often truncate or round numbers. (1.7)</p> <p><i>For example:</i> A decimal that repeats or terminates after a large number of digits is truncated or rounded.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Assessed within 7.1.2.4 <p style="color: red; text-align: center;">No Example Question on the State Sampler</p>	<p>(none)</p>
		<p>7.1.2.4</p>	<p>Solve problems in various contexts involving calculations with positive and negative rational numbers and positive integer exponents, including computing simple and compound interest. (1.7)</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: simple interest, compound interest & vgapg. 	<p>Nora is running a race that is 26.2 miles. She is running at a speed of 8 miles per hour. She has completed $\frac{3}{4}$ of the race. How much longer will it take Nora to finish the race?</p> <p><input type="radio"/> A. 0.82 hour</p> <p><input type="radio"/> B. 2.46 hours</p> <p><input type="radio"/> C. 3.28 hours</p> <p><input type="radio"/> D. 6.55 hours</p>
		<p>7.1.2.5</p>	<p>Use proportional reasoning to solve problems involving ratios in various contexts. (1.7)</p> <p><i>For example:</i> A recipe calls for milk, flour and sugar in a ratio of 4:6:3 (this is how recipes are often given in large institutions, such as hospitals). How much flour and milk would be needed with 1 cup of sugar?</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: proportion & vgapg. 	<p>Jeremy can plant 10 trees in 4 hours. How many trees can he plant in 10 hours?</p> <p><input type="radio"/> A. 16</p> <p><input type="radio"/> B. 25</p> <p><input type="radio"/> C. 40</p> <p><input type="radio"/> D. 100</p> <p style="color: red; text-align: center;">Modified Example</p> <p>Siris can plant 8 trees in 2 hours.</p> <p>How many trees can he plant in 8 hours?</p> <p><input type="radio"/> A. 16</p> <p><input type="radio"/> B. 32</p> <p><input type="radio"/> C. 64</p>

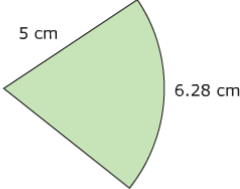
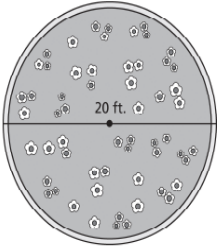
Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item
		7.1.2.6	Demonstrate an understanding of the relationship between the absolute value of a rational number and distance on a number line. Use the symbol for absolute value. <i>For example:</i> $ -3 $ represents the distance from -3 to 0 on a number line or 3 units; the distance between 3 and $\frac{9}{2}$ on the number line is $ 3 - \frac{9}{2} $ or $\frac{3}{2}$. (1.7) <u>Item Specifications</u> • Vocabulary allowed in items: absolute value &vgap.	Which describes $ k $ on a number line? <input type="radio"/> A. The opposite of k <input type="radio"/> B. The same value as k <input type="radio"/> C. A value between k and $-k$ <input type="radio"/> D. A distance k units from 0
Algebra MCA 16-20 Items Modified MCA 9-12 Items	Understand the concept of proportionality in real-world and mathematical situations, and distinguish between proportional and other relationships. MCA 1-2 Items Modified MCA 1-2 Items	7.2.1.1	Understand that a relationship between two variables, x and y , is proportional if it can be expressed in the form $\frac{y}{x} = k$ or $y = kx$. Distinguish proportional relationships from other relationships, including inversely proportional relationships ($xy = k$ or $y = \frac{k}{x}$). (1) <i>For example:</i> The radius and circumference of a circle are proportional, whereas the length x and the width y of a rectangle with area 12 are inversely proportional, since $xy = 12$ or equivalently, $y = \frac{12}{x}$. <u>Item Specifications</u> • Vocab allowed: proportional, inversely &vgap.	Which represents a proportional relationship? <input type="radio"/> A. $np = 5$ <input type="radio"/> B. $n = 2$ <input type="radio"/> C. $n = \frac{4}{p}$ <input type="radio"/> D. $\frac{n}{p} = 3$ Which represents a proportional relationship? <input type="radio"/> A.  <input type="radio"/> B.  <input type="radio"/> C.  <input type="radio"/> D. 
	Recognize proportional relationships in real-world and mathematical situations; represent these and other relationships with tables, verbal descriptions, symbols and graphs; solve	7.2.2.1	Represent proportional relationships with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. Determine the unit rate (constant of proportionality or slope) given any of these representations. (2) <i>For example:</i> Larry drives 114 miles and uses 5 gallons of gasoline. Sue drives 300 miles and uses 11.5 gallons of gasoline. Use equations and graphs to compare fuel efficiency and to determine the costs of various trips. <u>Item Specifications</u> • Vocabulary allowed in items: proportional, origin, slope &vgap.	Graph the line of the equation $y = 2x$. Click on 2 points on the coordinate grid. A line will connect the 2 points.  Modified Example Which graph represents the equation $y = 3x$? <input type="radio"/> A.  <input type="radio"/> B.  <input type="radio"/> C. 

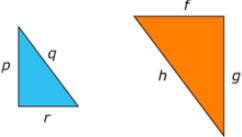
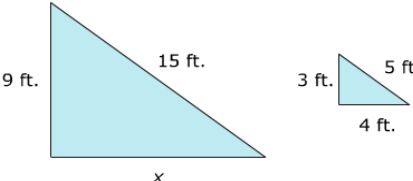
Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item																				
	<p>problems involving proportional relationships and explain results in the original context.</p> <p>MCA 6-8 Items Modified MCA 3-4 Items</p>	<p>7.2.2.2</p>	<p><i>Solve multi-step problems involving proportional relationships in numerous contexts. (2)</i></p> <p><i>For example: Distance-time, percent increase or decrease, discounts, tips, unit pricing, lengths in similar geometric figures, and unit conversion when a conversion factor is given, including conversion between different measurement systems.</i></p> <p><i>Another example: How many kilometers are there in 26.2 miles?</i></p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> Contexts may include (but are not limited to) discounts, tax and percent of change Vocabulary allowed in items: proportional & vgapg. 	<p>The table shows the cost of different numbers of boxes of cookies.</p> <table border="1"> <caption>Selling Cookies</caption> <thead> <tr> <th>Boxes of Cookies</th> <th>Cost (dollars)</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>11.25</td> </tr> <tr> <td>7</td> <td>15.75</td> </tr> <tr> <td>11</td> <td>24.75</td> </tr> </tbody> </table> <p>What is the cost to buy 15 boxes of cookies?</p> <p><input type="radio"/> A. \$33.75</p> <p><input type="radio"/> B. \$36.00</p> <p><input type="radio"/> C. \$40.50</p> <p><input type="radio"/> D. \$51.75</p> <p>Modified Example</p> <p>Jamie is selling cookies. She made a chart to show the cost of the cookies based on the number of boxes purchased.</p> <table border="1"> <caption>Cookie Costs</caption> <thead> <tr> <th>Number of Boxes</th> <th>1</th> <th>3</th> <th>5</th> <th>7</th> <th>9</th> </tr> </thead> <tbody> <tr> <td>Cost</td> <td>\$1.50</td> <td>\$4.50</td> <td>\$7.50</td> <td>\$10.50</td> <td>\$13.50</td> </tr> </tbody> </table> <p>What is the cost for 12 boxes of cookies?</p> <p><input type="radio"/> A. \$16.50</p> <p><input type="radio"/> B. \$18.00</p> <p><input type="radio"/> C. \$21.00</p>	Boxes of Cookies	Cost (dollars)	5	11.25	7	15.75	11	24.75	Number of Boxes	1	3	5	7	9	Cost	\$1.50	\$4.50	\$7.50	\$10.50	\$13.50
Boxes of Cookies	Cost (dollars)																							
5	11.25																							
7	15.75																							
11	24.75																							
Number of Boxes	1	3	5	7	9																			
Cost	\$1.50	\$4.50	\$7.50	\$10.50	\$13.50																			
		<p>7.2.2.3</p>	<p>Use knowledge of proportions to assess the reasonableness of solutions. (2)</p> <p><i>For example: Recognize that it would be unreasonable for a cashier to request \$200 if you purchase a \$225 item at 25% off.</i></p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> Assessed within 7.2.2.1 and 7.2.2.2 	<p>(none)</p>																				
		<p>7.2.2.4</p>	<p>Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers. (2)</p> <p><i>For example: "Four-fifths is three greater than the opposite of a number" can be represented as $\frac{4}{5} = -n + 3$, and "height no bigger than half the radius" can be represented as $h \leq \frac{r}{2}$.</i></p> <p><i>Another example: "x is at least -3 and less than 5" can be represented as $-3 \leq x < 5$, and also on a number line.</i></p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> Vocab allowed: vocab given at previous grades 	<p>On Mondays, Jayda runs between 2 and 5 miles. On Tuesdays, she runs 3 times as far as she runs on the previous Monday. Which inequality can be used to find x, the distance Jayda could run on a Tuesday?</p> <p><input type="radio"/> A. $2 < 3x < 5$</p> <p><input type="radio"/> B. $2 < 3x > 5$</p> <p><input type="radio"/> C. $2 < \frac{x}{3} < 5$</p> <p><input type="radio"/> D. $2 < \frac{x}{3} > 5$</p>																				

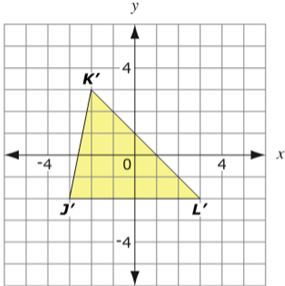
Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item
	Apply understanding of order of operations and algebraic properties to generate equivalent numerical and algebraic expressions containing positive and negative rational numbers and grouping symbols; evaluate such expressions.	7.2.3.1	<p>Use properties of algebra to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents. Properties of algebra include associative, commutative and distributive laws. (2)</p> <p><i>For example:</i> Combine like terms (use the distributive law) to write $3x - 7x + 1 = (3 - 7)x + 1 = -4x + 1$.</p> <p><i>Item Specifications</i></p> <ul style="list-style-type: none"> • Items must not have context • Vocabulary allowed in items: simplify & vgapg. 	<p>Simplify.</p> $8 - 2(n + 4)(-3)^2$ <p> <input type="radio"/> A. $-2n - 9$ <input type="radio"/> B. $-18n$ <input type="radio"/> C. $-18n - 64$ <input type="radio"/> D. $36n - 216$ </p> <p><u>Modified Example</u> Simplify.</p> $10 - 3(p + 2)$ <p> <input type="radio"/> A. $3p + 4$ <input type="radio"/> B. $-3p + 16$ <input type="radio"/> C. $-3p + 4$ </p>
		7.2.3.2	<p>Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables. (2)</p> <p><i>For example:</i> Evaluate the expression $\frac{1}{3}(2x - 5)^2$ at $x = 5$.</p> <p><i>Item Specifications</i></p> <ul style="list-style-type: none"> • Expressions contain no more than 3 variables • Vocabulary allowed in items: evaluate, substitute & vgapg. 	<p>What is the value of $4t^2 + 6r - tr$ when $t = -3$ and $r = 5$?</p> <p>Type your answer in the box.</p> <div style="border: 1px solid black; width: 40px; height: 20px; margin-left: auto; margin-right: 0;"></div>
		7.2.3.3	<p>Apply understanding of order of operations and grouping symbols when using calculators and other technologies. (2)</p> <p><i>For example:</i> Recognize the conventions of using a caret (^ raise to a power) and asterisk (* multiply); pay careful attention to the use of nested parentheses.</p> <p><i>Item Specifications</i></p> <ul style="list-style-type: none"> • Assessed within 7.2.3.1 and 7.2.3.2 	(none)

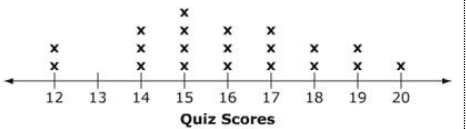
**MCA
4-6 Items
Modified MCA
2-4 Items**

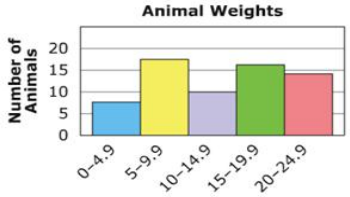
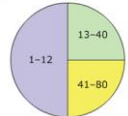
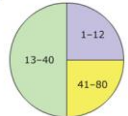

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item	
	<p>Represent real-world and mathematical situations using equations with variables. Solve equations symbolically, using the properties of equality. Also solve equations graphically and numerically. Interpret solutions in the original context.</p> <p>MCA 4-6 Items Modified MCA 2-4 Items</p>	<p>7.2.4.1</p> <p>7.2.4.2</p>	<p>Represent relationships in various contexts with equations involving variables and positive and negative rational numbers. Use the properties of equality to solve for the value of a variable. Interpret the solution in the original context. (3)</p> <p><i>For example:</i> Solve for w in the equation $P = 2w + 2\ell$ when $P = 3.5$ and $\ell = 0.4$.</p> <p><i>Another example:</i> To post an Internet website, Mary must pay \$300 for initial set up and a monthly fee of \$12. She has \$842 in savings, how long can she sustain her website?</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: vocabulary given at previous grades <p>Solve equations resulting from proportional relationships in various contexts. (3)</p> <p><i>For example:</i> Given the side lengths of one triangle and one side length of a second triangle that is similar to the first, find the remaining side lengths of the second triangle.</p> <p><i>Another example:</i> Determine the price of 12 yards of ribbon if 5 yards of ribbon cost \$1.85.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: vocabulary given at previous grades 	<p>The equation $y = 12x + 60$ can be used to estimate y, the height of a tree in centimeters x months after it is planted. When a tree is 150 cm tall, how long ago was the tree planted?</p> <p> <input type="radio"/> A. 7.5 months <input type="radio"/> B. 10.8 months <input type="radio"/> C. 17.5 months <input type="radio"/> D. 78.0 months </p> <p>Modified Example</p> <p>The equation shown can be used to find the height of a tree based on the number of months of growth.</p> $h = 10m + 50$ <table border="1"> <tr> <td> $h = 10m + 50$ $h =$ height in centimeters $m =$ number of months of growth </td> </tr> </table> <p>The tree has been growing for 4 months. What is h, the height of the tree?</p> <p> <input type="radio"/> A. 64 centimeters <input type="radio"/> B. 90 centimeters <input type="radio"/> C. 240 centimeters </p> <p>The equation $3c = 4s$ gives the relationship between c, the weight of clay, and s, the weight of sand in a mixture. There are 6.25 pounds of clay in the mixture. What is the weight of the sand?</p> <p> <input type="radio"/> A. 4.69 pounds <input type="radio"/> B. 8.88 pounds <input type="radio"/> C. 18.75 pounds <input type="radio"/> D. 75.00 pounds </p>	$h = 10m + 50$ $h =$ height in centimeters $m =$ number of months of growth
$h = 10m + 50$ $h =$ height in centimeters $m =$ number of months of growth					

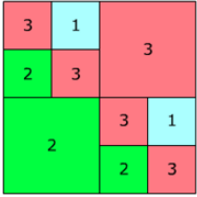
Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item					
Geometry & Measurement MCA 8-10 Items Modified MCA 7-9 Items MCA 4-5 Items Modified MCA 3-6 Items	Use reasoning with proportions and ratios to determine measurements, justify formulas and solve real-world and mathematical problems involving circles and related geometric figures. MCA 4-5 Items Modified MCA 3-6 Items	7.3.1.1	Demonstrate an understanding of the proportional relationship between the diameter and circumference of a circle and that the unit rate (constant of proportionality) is π . Calculate the circumference and area of circles and sectors of circles to solve problems in various contexts. (2.5) <u>Item Specifications</u> <ul style="list-style-type: none"> • Allowable notation: π (written as a symbol, not as “pi”) • Items may assess finding the area and arc length of a sector • Items do not assess finding the perimeter of a sector • Vocabulary allowed in items: radius, diameter, circumference & vgap. 	A sector of a circle is shown.  What is the area of the sector? (Use 3.14 for π .) <ul style="list-style-type: none"> <input type="radio"/> A. 12.5 cm² <input type="radio"/> B. 15.7 cm² <input type="radio"/> C. 31.4 cm² <input type="radio"/> D. 78.5 cm² <p style="text-align: center;">Modified Example</p> Alex has a circular flower garden. The diameter of the garden is 20 feet.  <table border="1"> <tr> <td>Circumference of a Circle</td> </tr> <tr> <td>$C = 2\pi r$</td> </tr> <tr> <td>$C =$ circumference</td> </tr> <tr> <td>$r =$ radius</td> </tr> <tr> <td>(Use 3.14 for π.)</td> </tr> </table> What is the circumference of the flower garden? A. 62.8 feet B. 125.6 feet C. 314 feet	Circumference of a Circle	$C = 2\pi r$	$C =$ circumference	$r =$ radius	(Use 3.14 for π .)
		Circumference of a Circle							
$C = 2\pi r$									
$C =$ circumference									
$r =$ radius									
(Use 3.14 for π .)									
7.3.1.2	Calculate the volume and surface area of cylinders and justify the formulas used. (2.5) <u>For example:</u> Justify the formula for the surface area of a cylinder by decomposing the surface into two circles and a rectangle. <u>Item Specifications</u> <ul style="list-style-type: none"> • Units must be consistent throughout an item; conversions are not allowed • Vocabulary allowed in items: radius, diameter, circumference, cylinder, lateral area & vgap. 	A cylinder has a height of x inches. The diameter of the base is also x inches. Which gives the volume of the cylinder? <ul style="list-style-type: none"> <input type="radio"/> A. $2\pi x^2$ <input type="radio"/> B. $\frac{1}{4}\pi x^3$ <input type="radio"/> C. $\frac{1}{2}\pi x^3$ <input type="radio"/> D. πx^3 							

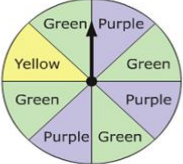
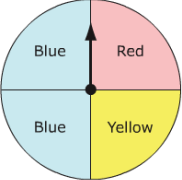
Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item				
	<p>Analyze the effect of change of scale, translations and reflections on the attributes of two-dimensional figures.</p> <p style="text-align: center;">MCA 4-5 Items</p> <p style="text-align: center;">Modified MCA 3-6 Items</p>	7.3.2.1	<p>Describe the properties of similarity, compare geometric figures for similarity, and determine scale factors. (1.25)</p> <p><i>For example:</i> Corresponding angles in similar geometric figures have the same measure.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Allowable notation: \sim (similar), \cong (congruent), \overline{FG} (segment FG), FG (length of segment FG) • Vocabulary allowed in items: similar, corresponding, scale factor & vgap. 	<p>$\triangle EFG$ is similar to $\triangle JKL$ and $\triangle JKL$ is similar to $\triangle QRS$. Which statement must be true?</p> <p><input type="radio"/> A. $\triangle EFG$ is congruent to $\triangle QRS$.</p> <p><input type="radio"/> B. $\triangle EFG$ is similar to $\triangle QRS$.</p> <p><input type="radio"/> C. $\triangle EFG$ is a reflection of $\triangle QRS$.</p> <p><input type="radio"/> D. There is no relationship between $\triangle EFG$ and $\triangle QRS$.</p>				
		7.3.2.2	<p>Apply scale factors, length ratios and area ratios to determine side lengths and areas of similar geometric figures. (1.25)</p> <p><i>For example:</i> If two similar rectangles have heights of 3 and 5, and the first rectangle has a base of length 7, the base of the second rectangle has length $\frac{35}{3}$.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Allowable notation: \sim (similar), \cong (congruent), \overline{FG} (segment FG), FG (length of segment FG) • Vocabulary allowed in items: similar, corresponding, scale factor & vgap. 	<p>The 2 figures shown are similar.</p>  <p>Make a proportion to show the relationship between the lengths of the sides. Click and drag the variables where you want to put them.</p> <div style="text-align: center;"> $\frac{\square}{\square} = \frac{\square}{\square}$ <table border="1" style="margin: auto;"> <tr> <td>p</td> <td>q</td> <td>r</td> </tr> <tr> <td>f</td> <td>g</td> <td>h</td> </tr> </table> </div> <p style="text-align: center;">Modified Example</p> <p>The triangles shown are similar.</p>  <p>What is the value of x?</p> <p><input type="radio"/> A. 8 ft.</p> <p><input type="radio"/> B. 12 ft.</p> <p><input type="radio"/> C. 14 ft.</p>	p	q	r	f
p	q	r						
f	g	h						

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item
		7.3.2.3	<p>Use proportions and ratios to solve problems involving scale drawings and conversions of measurement units. (1.25)</p> <p><i>For example:</i> 1 square foot equals 144 square inches.</p> <p><i>Another example:</i> In a map where 1 inch represents 50 miles, $\frac{1}{2}$ inch represents 25 miles.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Conversions are limited to no more than 2 per item • Vocabulary allowed in items: similar, corresponding, scale drawing, conversion &vgapg. 	<p>A map uses the scale 1.5 cm = 25 mi. Two cities are 190 miles apart. How far apart are the cities on the map?</p> <p><input type="radio"/> A. 0.21 cm</p> <p><input type="radio"/> B. 11.4 cm</p> <p><input type="radio"/> C. 2,917 cm</p> <p><input type="radio"/> D. 6,563 cm</p> <p>Modified Example</p> <p>A map uses the scale 1.5 cm = 30 miles.</p> <p>The cities of Pineview and Oakwood are 90 miles apart.</p> <p>How far apart are Pineview and Oakwood on the map?</p> <p><input type="radio"/> A. 3.15 cm</p> <p><input type="radio"/> B. 4.5 cm</p> <p><input type="radio"/> C. 31.5 cm</p>
		7.3.2.4	<p>Graph and describe translations and reflections of figures on a coordinate grid and determine the coordinates of the vertices of the figure after the transformation. (1.25)</p> <p><i>For example:</i> The point (1, 2) moves to (-1, 2) after reflection about the y-axis.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Allowable notation: J and J' (labels for points before and after transformation) • Allowable translation notation: $(x,y) \rightarrow (x + 3, y - 2)$ • Images may be reflected over vertical lines, horizontal lines and the lines $y=x$ and $y=-x$ • Vocabulary allowed in items: vocabulary given at previous grades 	<p>The translation $(x, y) \rightarrow (x - 4, y + 5)$ was used to move $\triangle JKL$ to $\triangle J'K'L'$. $\triangle J'K'L'$ is shown on the grid.</p>  <p>What are the coordinates of point K?</p> <p><input type="radio"/> A. (-6, 8)</p> <p><input type="radio"/> B. (-4, 5)</p> <p><input type="radio"/> C. (-2, 3)</p> <p><input type="radio"/> D. (2, -2)</p>

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item												
Data Analysis & Probability MCA 8-10 Items Modified MCA 8-10 Items	Use mean, median and range to draw conclusions about data and make predictions. MCA 3-5 Items Modified MCA 3-5 Items	7.4.1.1	<p>Design simple experiments and collect data. Determine mean, median and range for quantitative data and from data represented in a display. Use these quantities to draw conclusions about the data, compare different data sets, and make predictions. (2.5)</p> <p><i>For example:</i> By looking at data from the past, Sandy calculated that the mean gas mileage for her car was 28 miles per gallon. She expects to travel 400 miles during the next week. Predict the approximate number of gallons that she will use.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Data displays are limited to no more than 10 categories • Data displays from previous grades may be used • Vocabulary allowed in items: stem-and-leaf plot & vgagp. 	<p>The number of students of each age on a bus is shown in the table.</p> <p style="text-align: center;">Ages of Students</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Age (years)</th> <th>Number of Students</th> </tr> </thead> <tbody> <tr> <td>13</td> <td>2</td> </tr> <tr> <td>14</td> <td>10</td> </tr> <tr> <td>15</td> <td>5</td> </tr> <tr> <td>16</td> <td>18</td> </tr> <tr> <td>17</td> <td>24</td> </tr> </tbody> </table> <p>What is the median age of the students?</p> <p><input type="radio"/> A. 10 years</p> <p><input type="radio"/> B. 14 years</p> <p><input type="radio"/> C. 15 years</p> <p><input type="radio"/> D. 16 years</p> <p style="text-align: center; color: red;"><u>Modified Example</u></p> <p>Lin has 5 uncles.</p> <p>Their ages are shown.</p> <p style="text-align: center;">34 36 36 39 40</p> <p>Which measure of this data is the greatest?</p> <p>A. Mean</p> <p>B. Median</p> <p>C. Range</p>	Age (years)	Number of Students	13	2	14	10	15	5	16	18	17	24
		Age (years)	Number of Students													
13	2															
14	10															
15	5															
16	18															
17	24															
7.4.1.2	<p>Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Know how to create data displays using a spreadsheet to examine this impact. (2.5)</p> <p><i>For example:</i> How does dropping the lowest test score affect a student's mean test score?</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Data sets are limited to no more than 10 data points • Vocabulary allowed in items: outlier & vgagp. 	<p>A teacher made a line plot to show the scores of a quiz. After 2 more students took the quiz, the mean score was 16. Plot 2 possible scores on the line plot to make the mean 16.</p> <p>Click on the number line to plot the points.</p>  <p style="text-align: center;">Quiz Scores</p>														

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item										
	<p>Display and interpret data in a variety of ways, including circle graphs and histograms.</p> <p>MCA 1-2 Items</p> <p>Modified MCA 1-2 Items</p>	7.4.2.1	<p>Use reasoning with proportions to display and interpret data in circle graphs (pie charts) and histograms. Choose the appropriate data display and know how to create the display using a spreadsheet or other graphing technology. (2)</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Data sets are limited to no more than 10 data points • Vocabulary allowed in items: circle graph, histogram, frequency table & vgpg. 	<p>A veterinarian recorded the weights of animals in a histogram.</p>  <p>Animal Weights</p> <p>Which question can be answered using the information from the histogram?</p> <ul style="list-style-type: none"> <input type="radio"/> A. How many animals weigh 4.9 pounds? <input type="radio"/> B. How many animals weigh between 5 and 10 pounds? <input type="radio"/> C. How many animals weigh less than 8 pounds? <input type="radio"/> D. How many animals weigh at least 15 pounds? <p>Modified Example</p> <p>Which graph represents the data in the table?</p> <table border="1"> <thead> <tr> <th colspan="2">Family Ages</th> </tr> <tr> <th>Age (years)</th> <th>Number of People</th> </tr> </thead> <tbody> <tr> <td>1-12</td> <td>14</td> </tr> <tr> <td>13-40</td> <td>28</td> </tr> <tr> <td>41-80</td> <td>14</td> </tr> </tbody> </table> <p><input type="radio"/> A.  <input type="radio"/> B.  <input type="radio"/> C. </p>	Family Ages		Age (years)	Number of People	1-12	14	13-40	28	41-80	14
Family Ages														
Age (years)	Number of People													
1-12	14													
13-40	28													
41-80	14													
	<p>Calculate probabilities and reason about probabilities using proportions to solve real-world and</p>	7.4.3.1	<p>Use random numbers generated by a calculator or a spreadsheet or taken from a table to simulate situations involving randomness, make a histogram to display the results, and compare the results to known probabilities. (1.7)</p> <p><u>For example:</u> Use a spreadsheet function such as RANDBETWEEN(1, 10) to generate random whole numbers from 1 to 10, and display the results in a histogram.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Not assessed on MCA-III 	(none)										

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item										
	mathematical problems. MCA 3-5 Items Modified MCA 3-5 Items	7.4.3.2	<p>Calculate probability as a fraction of sample space or as a fraction of area. Express probabilities as percents, decimals and fractions. (1.7)</p> <p><i>For example:</i> Determine probabilities for different outcomes in game spinners by finding fractions of the area of the spinner.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> Vocabulary allowed in items: vocabulary given at previous grades 	<p>Leon uses squares to make a board. He randomly throws a stone onto the board.</p>  <p>What is the probability the stone lands on a space marked 3?</p> <p> <input type="radio"/> A. $\frac{1}{10}$ <input type="radio"/> B. $\frac{1}{4}$ <input type="radio"/> C. $\frac{1}{3}$ <input type="radio"/> D. $\frac{1}{2}$ </p> <p>Modified Example</p> <p>It is Michael's turn to choose the class activity for gym on Friday.</p> <p>The teacher puts slips of paper in a jar, as shown in the table, and Michael chooses one slip of paper without looking.</p> <p style="text-align: center;">Gym Activity Choices</p> <table border="1"> <thead> <tr> <th>Gym Activity</th> <th>Number of Slips of Paper</th> </tr> </thead> <tbody> <tr> <td>Floor hockey</td> <td>4</td> </tr> <tr> <td>Basketball</td> <td>5</td> </tr> <tr> <td>Archery</td> <td>4</td> </tr> <tr> <td>Volleyball</td> <td>7</td> </tr> </tbody> </table> <p>What is the probability that Michael will choose volleyball?</p> <p> <input type="radio"/> A. $\frac{1}{7}$ <input type="radio"/> B. $\frac{7}{13}$ <input type="radio"/> C. $\frac{7}{20}$ </p>	Gym Activity	Number of Slips of Paper	Floor hockey	4	Basketball	5	Archery	4	Volleyball	7
Gym Activity	Number of Slips of Paper													
Floor hockey	4													
Basketball	5													
Archery	4													
Volleyball	7													

Strand	Standard	No.	Benchmark (7 th Grade)	Sampler Item
			<p>Use proportional reasoning to draw conclusions about and predict relative frequencies of outcomes based on probabilities. (1.7)</p> <p>7.4.3.3 <i>For example:</i> When rolling a number cube 600 times, one would predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</p> <p><u>Item Specifications</u></p> <ul style="list-style-type: none"> • Vocabulary allowed in items: vocabulary given at previous grades 	<p>A spinner is divided into 8 equal sections. Lara spins the spinner 120 times. It lands on purple 30 times.</p>  <p>How many more times does Lara need to spin the spinner and have it land on purple for the relative frequency to equal the theoretical probability?</p> <p> <input type="radio"/> A. 15 <input type="radio"/> B. 24 <input type="radio"/> C. 45 <input type="radio"/> D. 54 </p> <p>Modified Example</p> <p>A spinner is shown.</p>  <p>The arrow on the spinner is spun 50 times. How many times is the arrow likely to land on a blue section?</p> <p> <input type="radio"/> A. 12 <input type="radio"/> B. 25 <input type="radio"/> C. 50 </p>